

UNIVERSITY OF ALBERTA LIBRARY



0 1620 1210 5928



EX LIBRIS
UNIVERSITATIS
ALBERTENSIS







Digitized by the Internet Archive
in 2019 with funding from
University of Alberta Libraries

<https://archive.org/details/bluejay551sask>



BLUE JAY

March 1997



Blue Jay, founded in 1942 by Isabel M. Priestly, is a journal of natural history and conservation for Saskatchewan and adjacent regions. It is published quarterly by **Nature Saskatchewan, 206-1860 Lorne Street, Regina, Saskatchewan, S4P 2L7.**

CN ISSN 0006-5099.

Editor: Roy D. John

Associate Editors: Margaret Belcher, Ronald Hooper, Robert W. Nero, Carol A. Scott, C. Stuart Houston, G.R.A. Ebel, James Duncan, Ross Dickson.

EDITORIAL INFORMATION: All items for publication should be addressed to the editor, care of Nature Saskatchewan (see address at top). Deadlines for each issue are two months prior to issue, i.e. 1 January, 1 April, 1 July, and 1 October. Please include author's telephone number for editorial contact, if necessary. Manuscripts should be submitted in duplicate. Manuscripts may also be submitted in text file form on 3.5 inch diskettes, which will be returned to authors when copies have been made. Word Perfect files may be sent to the NS office as an attachment to an E-mail message. The NS internet address is nature.sask@ucomnet.unibase.com. NS also has a home page on the internet. The address is <http://www.unibase.com/~naturesk>. The editor uses Word Perfect 6 and can accept manuscripts in any format. For further assistance see "Guidelines for Authors," *Blue Jay* 53, no. 4, or contact the editor. R.W. Nero abstracts *Blue Jay* for *Recent Ornithological Literature*. *Blue Jay* is abstracted by BIOSIS.

Common names are used for species where possible. Bird names follow the 1983 revision of the *American Ornithologists' Union Check-list* and subsequent supplements. Mammals are from Banfield's *The Mammals of Canada* (1974). Fish names are from the American Fisheries Society Special Publication #20 (1991). Since insect, herpetile and plant names are not standardized, scientific names are included, with authorities where deemed necessary.

Photographs submitted may be slides or prints. Nature Saskatchewan does not guarantee that any photographic submissions will be returned. Send a copy, unless you don't want to save the original. Prints will be returned on request. Deadlines for photographic materials are one month prior to issue, i.e. 1 February, 1 May, 1 August, and 1 November.

Any material printed for the *Blue Jay* may be reproduced without permission. Credit lines are appreciated. Use of photographs and poetry requires written permission from the photographer/author.

ADVERTISING: Advertising rates may be obtained from Nature Saskatchewan (address at top).

REPRINTS: A maximum of five reprints of an article are available to authors for a charge of \$0.25 each. Contributors wishing a few extra copies of the current issue may get them at cost. Requests for reprints or extra copies should be made to the Nature Saskatchewan office when the material is submitted for publication.

SUBSCRIPTION: Send all renewals, new memberships and correspondence concerning changes of address to Nature Saskatchewan (address at top). Renewal form on last page.

Bulk orders (minimum of five copies to one address) are available to society members and educational institutions at the rate of \$15 for the first subscription and \$13 for each additional one. Outside Canada, fees are \$18. We do not collect GST on memberships.

Cover: Trumpeter Swans. Photo by G.W. Beyersbergen.

Published by the Canadian Plains Research Center, University of Regina. Printed by Merit Printing, Regina, Saskatchewan, on 10% recycled paper.

THIS ORGANIZATION RECEIVES FUNDING FROM



Blue Jay

Vol. 55 No. 1 March 1997 1-80

Editor's Message ii

Birds

55TH ANNUAL CHRISTMAS BIRD COUNT -1996.

Compiled by *Wayne C. Harris* 1

THE 19TH-CENTURY TRADE IN SWAN SKINS AND QUILLS.

C. Stuart Houston, Mary I. Houston and Henry M. Reeves 24

SIGNIFICANT OBSERVATIONS OF TRUMPETER SWANS IN

SASKATCHEWAN. *Harold H. Burgess* 35

A MUTE SWAN FLYBY AT SPRINGER LAKE, MANITOBA. *Peter Taylor* 41

BIRDS AND TRANSMISSION LINES. *Carolyn Curtis* 43

RECOVERIES OF MOUNTAIN BLUEBIRDS SOUTH OF 49° LATITUDE,

AND A RECENT TREE SWALLOW. *Donald J. Stiles* 48

Plants

A REPORT OF THE OCCURRENCE OF A BLUE-GREEN ALGA,

ANABAENA, IN CELLS OF A GREEN ALGA, *RHIZOCLONIUM*.

M.V.S. Raju and Bernard De Vries 53

Mammals

SASKATCHEWAN CHRISTMAS MAMMAL COUNT -1996.

Compiled by *Wayne C. Harris* 57

RACCOONS DON'T ALWAYS SHUN CITIES. *Wally Kost* 67

Geology

"THE ROCK PILE," CYPRESS HILLS, SASKATCHEWAN. *Rudy W. Klassen* 69

Notes and Letters

COMMENTS ON ESKIMO CURLEW SIGHTINGS. *Bernie Gollop* 75

CALLING ALL BIRDERS 80



EDITOR'S MESSAGE

Editor's Message

This issue should see *Blue Jay* back to its original schedule. In putting out the last three issues I have learned many things and I would like to share some of these with you.

We have received some handwritten material. While this is welcome as input I would ask that you take extra pains to write clearly. In a couple of instances we needed a combined effort to divine the words — correctly I hope!

Most of the material comes in on disk, which makes my life a little easier. I ask all who use word processors *not* to include any format codes (such as, centre, changes in font size, indents, pagination and tabs). The publishing software automatically puts text into *Blue Jay* format, and it cannot do this if it has to fight with competing codes. Bold, italics and superscripts *within the text* are not a problem. The longer you spend making the presentation exciting the longer I spend stripping it of its codes!

I prefer to receive tables as hard copy — hand drawn if necessary. Again, the publishing software cannot take a previously formatted table with competing codes. It is also difficult to enter a table at the right place in the text until after the text has been entered and the page layout defined. I have an additional problem in the editing process. I am still finding it difficult to estimate the material required for a single issue. Currently I use the number of bytes, but tables distort this value by their high format requirements, leaving me perplexed. If you do send tables on disk I would prefer them as separate files.

Finally, I think we should conserve paper by not using double spacing. Editing and reviewing a single-spaced document is a little more difficult but I believe we should save the trees. Also, I would prefer that references be kept to a few key publications, typically less than ten.

Sincerely,

Roy D. John



55th ANNUAL SASKATCHEWAN CHRISTMAS BIRD COUNT — 1996

Compiled by WAYNE C. HARRIS, Saskatchewan Environment and Resource Management,
350 Cheadle Street West, Swift Current, Saskatchewan. S9H 4G3

Harsher conditions, than we have become accustomed to, prevailed during the 1996 count period (December 20 - January 5). Snow cover was greater than normal especially in the south and temperatures were below normal. If not for the warming trend during the last few days of the count, this would have been the coldest count period in recent times. The 92 counts completed this year, were six more than last year but well below the maximum number 99 in 1991. The number of people participating decreased from 729 in 1995 to 666 this year.

Weather and Coverage

Table 1 summarizes the weather conditions reported on the counts. As indicated the temperatures were colder than last year but still above the normal with the average overnight low being -22°C and the daytime highs averaged -17°C . Endeavour had the coldest night at -44 while White Bear reached a high of $+3$. The average snow depth for the entire province was almost 30 cm.

The birds

Ninety-five species were recorded on count day with an additional five species during the count period giving an overall total of 100 species, equaling the all-time high set in 1988. The results are compiled in Tables 3, 4 and 5. The total number of birds seen totaled 66,874 individuals down more than 30% from last years 97,585. The most abundant species were Snow Bunting 15,565 individuals followed by House Sparrow with 13,909.

Population trends of some common species are provided in Table 7. Substantial increases were for both Sharp-tailed Grouse and Gray Partridge. Red Crossbills were more common than normal. House Finch populations continue to increase both in numbers and distribution.

Raptor populations declined. The only exception to this was Northern Goshawks that were up following increasing hare and grouse numbers. Although the decline in Bald Eagles is not surprising with the return of colder temperatures that of Golden Eagles is. Following the Golden Eagle's downward pattern are Merlin, Prairie Falcon, Rough-legged Hawk, Snowy Owl and even Great Horned Owl.

New Species

Two new species were reported bringing the all-time list to 164 species. The first was a Barrow's Goldeneye found at Squaw Rapids. A single Lark Bunting was at Moose Jaw. Although this species is common during the summer months this is the first time one has attempted to over winter.

Rare Species

Table 4 lists the least frequent species on the counts and the rarest species are all in this table. A Lincoln's Sparrow at Gardiner Dam was the second time in two years the species was seen on count day with only two records both being count period records. Other rarities include a White Pelican at Gardiner Dam, Brown-headed Cowbird at Whitewood and Mountain Chickadee at Cypress Hills Provincial Park.

House Finches were reported from five counts; the previous high count of 44 at Moose Jaw almost doubled to 78 at Regina. The cold extremes of our winters are obviously not going to stop the spread of this species that has expanded rapidly westward from eastern North America in the past ten years.

Table 6 summarizes new high counts recorded for species during the 1996 count.

Count Areas and Participants

(Names of compilers are in *italics*. Number of participants in each count are in parentheses following the names.)

1. ARCHERWILL. Joanne Folstad, Pauline Hnetka, **Elaine Hughes**, Annette Kozak, Judy Revoy, Doris Slind. (6)
2. ARMIT. Anne Harris, Valeri Harris, **Wayne Harris**, Sheila Lamont. (4)
3. ASSINIBOIA. Ed Bearss, Jack Burgeson, **Cecil Hayward**, Nelson Lamb, Dave Landa, Delmar Pettem, Wilf Prentice. (7)
4. BANGOR. Judith Davis, **Jean Hilton**, Minnie Hughes. (3)
5. BETHUNE. **Doug and Vera Laing**. (2)
6. BIGGAR. Roger Assailly, Murray Newton, Dave Pickett, **Guy Wapple**, Megan Wapple, Robert Wapple, Sandra Wapple. (7)
7. BIG RIVER. Aaron Honig, Christopher Honig, Colleen Honig, **Glenn Honig**, Michelle Honig. (5)
8. BIRCH HILLS. Marg Mareschal, **Moe Mareschal**, Beryl Wait, Don Weidl. (4)
9. BRIGHTWATER RESERVOIR. Andy Didiuk, Hadie Harder, Henry Harder, Doug Peters, Ed Peters, **Alan Smith**. (6)
10. BROADVIEW. Doug Boivin, **Dave Chaskavich**, Don Weidl, Tony Weidl. (4)
11. BROMHEAD. **Martin Bailey**, Carol Bjorklund. (2)
12. CANDLE LAKE. **Burke Korol**, John Korol, Helen Korol, Penny Pearse. (4)
13. CHITEK LAKE. **Marcel Cornect**. (1)
14. CIGAR LAKE. **Cameron Jackson**. (1)
15. CLARK'S CROSSING. Nancy Allan, Allyson Brady, Stephanie Gundlach, Jim Hay, Elaine Hughes, Roy John, Marlene Kalanack, Minna Korhonen, Kay Krueger, Gerard Lahey, Cliff Matthews, Mack Miller, John Nickel, Hilda Noton, Keith Pahl, Martin Stoffel, Jim Wedgwood, **Michael Williams**. (18)
16. CORONACH. **Wayne Harris**. (1)
17. CRAVEN. Margaret Belcher, Betty Binnie, Gerhardt Bruins, Jon Herriot, Kate Herriot, **Trevor Herriot**, Bob Kreba, Kevin Moore, Ron Myers, Bill Ogilvie, Gabriel Roy-Wright, Orion Roy-Wright, James Sapara, Robert Wright. (14)
18. CROOKED LAKE. Bill Livsay, Martha Livsay, Boyd Metzler, John Pollock, **Dorothy Skene**, Ed Skene. (6)
19. CROOKED RIVER. Burnie Lewis, Joyce Lewis, Kristine Mehler, **Margaret Mehler**, Morley Mehler. (5)
20. CYPRESS HILLS PROVINCIAL PARK (Centre Block). Wayne Harris, Larry Helmerson, Brad Mason, Sue McAdam, **Melody Nagel-Hisey**, Pake Newell. (6)
21. DILKE. **Brian McArton**, Wilfred McArton. (2)
22. DUVAL. George Herber, Merv Hey, Iain Richardson, Lloyd Saul. (4)
23. EASTEND. **Henri Lebastard**. (1)
24. EMMA LAKE. Glen Hanson, Jean Hanson, **Deanna Krug**, Norman Krug. (4)
25. ENDEAVOUR. **Norman Harris**. (1)
26. FENTON. **Carman Dodge**, Don Weidl. (2)
27. FIFE LAKE. **Martin Myers**, Robert Rafuse. (2)

8. FORT QU'APPELLE. James Armstrong, Peter Ashcroft, Phyllis Bordass, Evelyn Chuback, Errol Cochrane, Vera Cousins, Anne Davies, **Ronald Hooper**, Lois Lamontagne, Vic Lamontagne, George Laroocque, Maurice Lindgren, Don McDougall, Jean McKenna, Allan Mlazgar, Webb Palmer, Paul Paquin, Lorne Rowell, Lloyd Talbot, William Whiting. (20)
9. FORT WALSH. Anne Harris, Valeri Harris, Wayne Harris, Ron Jensen, Sheila Lamont, Wilkes Parsonage, Gary Provanchier, **Guy Wapple**, Robert Wapple, Jeff Zimmer. (10)
10. GARDINER DAM. Anne Harris, Valeri Harris, Wayne Harris, Jeffrey Jensen, Ron Jensen, Burke Korol, Sheila Lamont, Alan Smith, **Guy Wapple**, Robert Wapple, Dan Zazelenchuk. (11)
11. GOOD SPIRIT LAKE. **Bill Anaka**, Joyce Anaka, Julia Wiwchar. (3)
12. GOVENLOCK. Anne Harris, Valeri Harris, **Wayne Harris**, Ron Jensen, Sheila Lamont, Guy Wapple, Robert Wapple. (7)
13. GRASSLANDS NATIONAL PARK. **Wayne Harris**. (1)
14. GRASSLANDS NATIONAL PARK (NW). Shelly Duquette-Larson, **Pat Fargey**, Sherry Hohn, Florence Miller, Lise Perrault, Lorie Wiesner. (6)
15. GRAYSON. **Charles Helm**, Daniel Helm, Karl Zimmer. (3)
16. HEPBURN. **Phyllis Siemens**. (1)
17. HOLBIEN. Chlorus Harris, **Helen Harris**. (2)
18. HORSESHOE BEND (North of Kinistino). Daveen Berg, Verna Messer. (2)
19. HUMBOLDT. **Ed Brockmeyer**, Mike Volk. (2)
20. INDIAN HEAD. Jan Beattie, Denise Beaulieu, Heather Beaulieu, Pat Beaulieu, Rhys Beaulieu, Vic Beaulieu, Irv Escott, **David Gehl**, Roberta Gehl, Mavis Gray, Roger Gray, Roy Hearn, Gordon Howe, John Kort, Linda Kort, Dora Nichols, Norine Nichols, Laura Poppy, Brian Scott, Lorne Scott, Christine Skinner, Fred Skinner, Joyce Skinner, Linda Skinner, Charles Thompson, Eileen Varley, Jack Varley, Gordon Willerth. (27)
41. KAMSACK. John Barisoff, Gordon and Hazel Bernard, Agnes Betz, Mable Buceuk, Lindee Dewores, Barb Ellasser, Elsie Ellasser, Anita Klocko, Laura Loeppky, W.J.C. May, Helen Panchuk, Kelsey and Ryley Rezansoff, **Isabel Ritchie**, Elsie Severson, John Solmon, Elenor Sookocheef, Tillie Shatatoski, Elona Zeiben. (20)
42. KELVINGTON. Pat Finnie, **Dianne Sloan**, Elaine Sloan, Marguerite Sloan. (4)
43. KENASTON. Doug Beckie, **Lawrence Beckie**. (2)
44. KILWINNING. Alan Daku, **Ed Driver**, Marg Driver. (3)
45. KINLOCH. **Don Forbes**, Doreen Forbes, Cliff Logan, Florence Oleksiewicz, Steve Oleksiewicz, Wilf Rodenberg. (6)
46. KUTAWAGAN LAKE. Valeri Harris, **Wayne Harris**, Sheila Lamont. (3)
47. KYLE. Cliff Matthews, Gordon Moreside. (2)
48. LARONGE. **Jim Paul**, Lorie Ann Paul. (2)
49. LAST MOUNTAIN LAKE N.W.A. Anne Harris, Valeri Harris, **Wayne Harris**, Sheila Lamont. (4)
50. LEADER (North). **Dalsy Meyers**. (1)
51. LEADER (South). John Flood, **Brenda Flood**. (2)
52. LIVELONG. **Sarah Pavka**. (1)
53. LOVE - TORCH RIVER. **Bert Dalziel**, Nora Dalziel, Samuel Dalziel, Anita Deutschmann, Eric Deutschmann, Betty Donovan, Bruce Donovan, Sean

- Donovan, Eileen L'Heureux, Mildred Long, Lynn Matthews, William Matthews. (11)
54. LUSELAND. **Kim Finley**, Estelle Finley, Graeme Finley, Liam Finley, Bill Frey, Margeret Frey. (6)
55. MACDOWALL. **Myron Barton**. (1)
56. MARYFIELD. **Daryl Johannesen**. (1)
57. MEADOW LAKE. Bill Caldwell, Byron Golly, Stuart Golly, Tyler Golly, **Bob Wilson**. (5)
58. MEATH PARK. **Joe Graumens**, Gerald Murphy. (2)
59. MELFORT. Dion Curry, **Phll Curry**, Kim Eskowich, Kate Johnson, S. Wittig. (4)
60. MELFORT (SE). Irene Deobald, **Frieda Markland**. (2)
61. MELVILLE. Bill Barmby, **Marlon MacLean**, Jeanette Olson, Ross Wotherspoon. (4)
62. MOOSE JAW. Pam Albert, Doug and Helen Brunsdon, Doug and Elsie Carrick, Barry and Fern Dowse, Ann Fysh, Kerri Hanley, Bob and Pat Kern, Cy and **Leith Knight**, Allen Lemieux, Connie and Hugh McIntyre, M. Mann, Mary Montague, Helen and Peter Norys, Wilma Pickering, Gavina Reekie, Ramsay Ross, Gus and Mike Sagal, Arie Van Dorland, Brenda Winch, Arthur Young. (28)
63. MOOSE MOUNTAIN. **Greg Bobbitt**, Ross Douglas, Dick Gutfriend, Keith Sakatch. (4)
64. NAICAM. Eldor Jensen, **Ron Jensen**. (2)
65. NIPAWIN. Vi Budd, **Joyce Christiansen**, Betty Hodgins, Doug Pegg. (4)
66. PIKE LAKE. Nancy Allan, Lawrence Beckie, Angie Bernier, Mark Bidwell, Patrick Bulman, Muriel Carlson, Ethel and Percy Crosthwaite, Betty Ann and Tom Dunlop, Dorothea Fisher, Dave and Marlene Froese, Joe Fry, Kathy Fry, Jean Gadd, Mary Gilliland, Bernie Gollop, Mike Gollop, Darlene Hay, Jim Hay, Judy Hommen, Robert Johanson, Roy John, Logan and Marie Kennedy, Gerard Lahey, Larry Maguire, Joyce Manton, Cliff Matthews, Menno Nickel, Keith Pahl, and Pauline Sawyer, Marguerite Schneider, Stan Shadick, Bill Sherbrooke, Martin Stoffel, Michael Williams, Jim Wood, Lois Wooding, Dwight and Nancy Young. (46)
67. PRINCE ALBERT. John Burt, Pamela Burt, Brian Christensen, Kim Clark, Tom Dice, **Carman Dodge**, Keith Dodge, Patty Edmonds, Joe Graumans, Phyllis Hayward, Murray Kyle, Tim Loran, Gerald Murphy, Lloyd Olson, Derry Perkins, Jerry Perkins, Les Senner, Winona Senner, Dave Stepnisky, Kathy Sutton, Jim Town, Franklin Vick, Jeannie Walker, Don Weidl, Lois Williams. (25)
68. PRINCE ALBERT NATIONAL PARK. Ed Brown, Hazel Brown, Kim Clark, Dan Frandsen, David Henry, Elizabeth Henry, Suzanne Henry, Maude Lefebure, Louis Letiecy, Bradley Muir, Pam Nelson, **Adam Pldwerbeski**, Dave Stepniski, Marg Tarleton, Dave Wieder. (15)
69. QU'APPELLE VALLEY DAM. Patrick Bulman, Roy John, Bob Plaster, Stan Shadick, **Michael Williams**. (5)
70. RAYMORE. Anne Harris, Valeri Harris, **Wayne Harris**, Sheila Lamont. (4)
71. REGINA. Sandy Ayer, Jessie Bailey, Margaret Belcher, Lionel Bonneville, Stephane Bonneville, Gerhard Bruin, Nancy Buschart, R. Creswell, Robert Ewart, Sandra Ewart, Margaret Fielding, Trevor Herriot, **Dale Hjertaas**, Paule Hjertaas, Phyllis Illsley, Fay Kathol, Bob Kreba, Bob Luterbach, Ron Meyers, Tom Riffle, Brian Rainey, Dean Richert, Miriam Richert, Karyn Scalise, Frank Switzer. (25)
72. ROCKGLEN - BORDERLAND. **Bob Rafuse**. (1)
73. ROUND LAKE (Qu'Appelle Valley). **Doug Francis**, Boyd Metzler, John Pollock. (3)
74. ROUND LAKE (Prince Albert). **Evelyn Marshall**. (1)

5. SASKATCHEWAN LANDING PROVINCIAL PARK. Calvin Fiala, **Wayne Harris**. (2)
6. SASKATOON. Nancy Allan, Tony Allen, Juhachi Asai, Kengo Asai, Sumiko Asai, Beverly Beland, Orval Beland, Brian Bentley, Bob Besant, Garth Besant, Joyce Besant, Mark Bidwell, Bernard Bisha, Eveline Boudreau, Gail Bunt, Bill Cates, Donna Cates, Louise Cook, Leah Currie, Anne Dzus, Randi Edmonds, Fran Eldridge, Melanie Elliott, Barbara Ens, Jean Gadd, Martin Gerard, Silvia Gerard, Michael Gilfillan, Mary Gilliland, Bernie Gollop, Madeleine Gollop, Mike Gollop, Kurt Greenwood, Jerry Haigh, John Hanbidge, Ramona Harms, Jim Hay, Mary Houston, Stuart Houston, Cherry Jackson, Roy John, Marlene Kalanack, Richard Kerbes, Barbara Kozmyk, Gerard Lahey, Erling Larson, Anna Leighton, Ted Leighton, Kathy Lindgren, Louise Roy Mark, Shirley McKercher, Cathryn Miller, David Miller, Muriel Miller, Bruce Noton, Keith Pahl, Orion Schille, Eldon Siemens, Jim Smart, Al Smith, Angela Stern, Crystal Stinson, Paul Stinson, Hilda Voth, Heather Wagg, Kirk Wallace, Jim Wedgwood, George West, **Michael Williams**, Jim Wood, Lois Wooding, Dan Zazelenchuk. (74)
7. SCOTT. **Guy Wapple**. (1)
8. SHAMROCK. **Hugh Henry**. (1)
9. SHAUNAVON. Debbie Aadland, Mrs. H. Anderson, Mrs. I. Innes, Mrs. P. Oberle, Carl Osterberg, **Marlene Osterberg**, Ruth Robertson, Mr. and Mrs. Dale Smith. (9)
10. SKULL CREEK. Frank Ballauf, Marryann Ballauf, **Jim Bennetto**, Ray Bennetto, Doris Bircham, Ralph Bircham, Greeba Drever, Ralph Drever, Vivian Nyen, Betty Mann, Robert Mann, Harvey Wasilow, Mark Wasilow. (14)
11. SNOWDEN. Allan and Rita Birkenthal, Elnore and Mike Bodnaruk, **Irene Hagel**, Karen Hagel, Jenny and Ralph Johnson, Violet Lien, Sharon Lindberg, Betty and Harold Pagan, Edna and Percy Pagan, Jack Pickett, Vera Schemenauer, Vicky Shwetz, Bev Smears, Emily Stensrud, Harold and Irene Thompson. (23)
82. SPALDING. Bill Spizawka, Christina Spizawka, Kerry Spizawka, **Velma Splzawka**. (4)
83. SPINNEY HILL. **Ed Driver**, Alan Smith. (2)
84. SQUAW RAPIDS. Anne Harris, Valeri Harris, **Wayne Harris**, Burke Korol, Sheila Lamont, Guy Wapple. (6)
85. SWIFT CURRENT. James Beattie, Hugh Henry, **Ron Jensen**, Walt Kreuger, Arlyne Lawson, Doug Lawson, Sue McAdam, Laura Siever, Floyd Stinson, Irene Stinson, Hillarie Tasche, Doris Thoreson, Neil Vandendort, Rachel Vandendort, John Weston, Pearl Weston, Dave Zacharis, Verdella Zacharis. (18)
86. TISDALE. **Joyce Mohr**. (1)
87. TURTLE LAKE (east). Marie Robinson, **Merril Robinson**. (2)
88. TURTLE LAKE(southeast). Ruth Brown, Carol Burand, **Muriel Carlson**, Gordon Eaton, Harold and Hazel Newton, J. Pultzer, Vickie Tollefson. (8)
89. WEYBURN. Mary Bakken, Leo Belanger, Louise Belanger, **Ray Belanger**, Greg Bobbitt, Harvey Gall, Fred Garner, Betty Layh, Phil Layh, Cy Marcotte, Elizabeth Murray, John Murray, Nick Postey, Keith Sakatch, Stew Stairmand, Sid Tripoff. (16)
90. WHITE BEAR. Floyd Jordheim, Randy Jordheim, **Sig Jordheim**. (3)
91. WHITEWOOD. Joe Ashfield, Ellen Blyth, Pat Connalley, Dallyn Holmstrom, Joyce Jordan, Wilfred Jordens, Bernice Juzyniec, Felix Juzyniec, Mavis Kay, Cindy McKay, Doreen McPhail, Jean Meadows, Illa Meszanos, **Boyd Metzler**, Erv Miller, John Pollock, Florence Pritchard, Len Santo, Diane Veresh. (20)
92. YORKTON. **Elinor Hjertaas**, Warren Hjertaas, Boyd Metzlar, Joyce Miller, Bill Peasley, John Pollock, Geoff Rushowick, James Rushowick, Patrick Rushowick, Hugh Semple, Dorothy Skene, Ed Skene, Harold Wilkinson, Ken Wood. (14)

Table 1. COUNT WEATHER CONDITIONS (Temperature oC, Wind kmph, Snow cm)

Locality	Min Temp	Max Temp	Min Wind	Max Wind	Min Snow	Max Snow	AM Sky	PM Sky
1. ARCHERWILL	-30	-25	0	5	20	25	clear	
2. ARMIT	-22	-11	0	20	30	40	partly cloudy	overcast, heavy snow
3. ASSINIBOIA	-12	-12	5	10	40	40		
4. BANGOR	-28	-21	15	18	30	35	clear	clear
5. BETHUNE	-20	-12	4	10	15	60	clear	clear
6. BIGGAR	-34	-30	0	25	12	70	clear	partly cloudy
7. BIG RIVER	-35	-28	0	0	18	25	clear	clear
8. BIRCH HILLS	-15	-11	0	15	15	50	overcast	overcast
9. BRIGHTWATER R.	-29	-20	0	10	5	40	overcast	overcast
10. BROADVIEW	-28	-18	5	10	10	75	clear	overcast
11. BROMHEAD	-20	-10	0	10	15	35	clear	clear
12. CANDLE LAKE	-31	-27	5	20	25	40	partly cloudy	overcast; light snow
13. CHITEK LAKE	-30	-30	2	8	8	10	mostly clear	mostly clear
14. CIGAR LAKE	-15	-15	5	10			overcast	overcast
15. CLARK'S CROSS.	-32	-29	0	15	15	60	clear	clear
16. CORONACH	-12	-3	0	15	0	30	clear	overcast; heavy fog
17. CRAVEN	-30	-25	5	10	60	100	partly cloudy	partly cloudy
18. CROOKED LAKE	-33	-27	10	15	12	50	clear	clear
19. CROOKED RIVER	-30	-30	5	10	30	40	clear	clear
20. CYPRESS HILLS P.P.	-18	-4	5	20	30	75	moderate fog	mostly clear
21. DILKE	-24	-18	40	40	5	50		
22. DUVAL	-28	-25	0	18	4	52	mostly clear	partly cloudy
23. EASTEND	-10	+2	0	5	0	50		
24. EMMA LAKE	-22	-15	20	30	35	40	overcast; light snow	overcast
25. ENDEAVOUR	-44	-28	0	5	50	60	clear	clear
26. FENTON	-17	-15	0	19	12	15	overcast, heavy fog, light snow	mostly clear
27. FIFE LAKE	-3	0	0	5	45	60		
28. FT. QU'APPELLE	-23	-18	0	15	20	28	clear	clear
29. FORT WALSH	-22	-20	10	30	5	65	overcast, light snow	partly cloudy
30. GARDINER DAM	-31	-29	10	30	10	60	partly cloudy	partly cloudy
31. GOOD SPIRIT L.	-35	-19	5	10	26	32	clear	mostly clear
32. GOVENLOCK	-20	-8	0	20	5	15	heavy fog	partly cloudy; light fog
33. GRASSLANDS N.P.	-29	-20	10	30	10	30	overcast	overcast, light snow
34. GRASSLANDS (NW)	-2	-4	18	22	15	50		
35. GRAYSON	-32	-25	5	20	30	100	partly cloudy	clear
36. HEPBURN	-23	-23	0	5	45	45	clear	clear
37. HOLBIEN	-30	-20	0	20	35	35	clear	clear
38. HORSESHOE BEND	-30	-20	0	0			clear	mostly clear
39. HUMBOLDT	-27	-25	10	10	10	15	partly cloudy	
40. INDIAN HEAD	-30	-25	10	15	30	45	partly cloudy	partly cloudy
41. KAMSACK								
42. KELVINGTON	-26	-20	0	5	60	75	clear	clear
43. KENASTON	-18	-14	0	10	10	15	mostly clear	mostly clear
44. KILWINNING	-16	-10	20	25	0	25	light snow	light snow
45. KINLOCH	-17	-12	10	20	29	34	partly cloudy	mostly clear
46. KUTAWAGAN L.	-12	-10	0	5	0	20	overcast	partly cloudy
47. KYLE	-27	-20	0	0	30	60	clear	partly cloudy
48. LARONGE	-22	-20	10	25	40	50	partly cloudy	overcast
49. LAST MT. L NWA.	-16	-12	20	40	0	5	overcast	overcast
50. LEADER (North)	-35	-20	2	5	20	50	overcast	overcast, moderate snow
51. LEADER (South)	-10	-6	30	50	60	60	partly cloudy	partly cloudy

Table 1. COUNT WEATHER CONDITIONS (Continued; Temp. oC, Wind kmph, Snow cm)

Locality	Min Temp	Max Temp	Min Wind	Max Wind	Min Snow	Max Snow	AM Sky	PM Sky
52. LIVELONG	-22	-20	20	25	60	60	overcast	overcast
53. LOVE -TORCH R.	-23	-18	0	5	30	50	overcast	partly cloudy
54. LUSELAND	-22	-12	0	10	6	65	mostly clear	mostly clear
55. MACDOWALL	-17	-12	5	25	15	20	overcast; moderate snow	overcast; moderate snow
56. MARYFIELD	-33	-31	10	15	30	60	partly cloudy, light snow	partly cloudy
57. MEADOW LAKE	-23	-20	25	40	6	24	clear	clear
58. MEATH PARK	-15	-15					Overcast	clear
59. MELFORT	-23	-22	20	25	25	30	clear	clear
60. MELFORT (SE)	-35	-29	2	3	10	15	mostly clear	mostly clear
61. MELVILLE	-30	-22	0	5	45	100	mostly clear	mostly clear
62. MOOSE JAW	-25	-22	8	9	30	60	overcast	overcast
63. MOOSE MT.	-11	-2	0	25	15	28	overcast,mod. fog, light snow	overcast, moderate fog, moderate snow
64. NAICAM	-12	-12	20	20	10	70	overcast moderate fog	partly cloudy
65. NIPAWIN	-25	-25	0	5	58	58	clear	clear
66. PIKE LAKE	-17	-15	5	17	25	50	overcast, light fog, light snow	mostly clear
67. PRINCE ALBERT	-33	-29	6	15	15	25	clear	clear
68. PRINCE ALBERT N.P.	-40	-33	5	15	20	50	clear	clear
69. QUAPPELLE V. DAM	-21	-15	0	15	15	90	partly cloudy; light fog	partly cloudy
70. RAYMORE	-13	-4	0	20	0	30	clear	clear
71. REGINA	-33	-22	10	15	25	45	mostly clear	mostly clear
72. ROCKGLEN	-3	-3	0	5	45	45	clear	
73. ROUND LAKE (QM)	-16	-11	5	30	30	80	clear	clear
74. ROUND LAKE (PA)	-33	-29	6	15	15	25	clear	clear
75. SK. LANDING P.P.	-7	-3	0	10	0	10	mostly clear	partly cloudy
76. SASKATOON	-32	-24	0	15	5	35	clear	clear
77. SCOTT	-23	-21	25	30	5	40	overcast	overcast, light snow
78. SHAMROCK	-30	-26	1	10	30	60	clear	clear
79. SHAUNAVON	-29	-13						
80. SKULL CREEK	-18	-20	0	0	20	25	clear	clear
81. SNOWDEN	-15	-12	0	0			overcast, heavy snow	partly cloudy
82. SPALDING	-15	-25	10	15	40	50	overcast	clear
83. SPINNEY HILL	-16	-13	25	25	0	70	light snow	light snow
84. SQUAW RAPIDS	-10	-5	30	40	15	18	overcast	partly cloudy
85. SWIFT CURRENT	-30	-22			10	90	overcast	overcast
86. TISDALE					45	50	overcast	partly cloudy
87. TURTLE LAKE (E)	-30	-25	5	10	25	40		
88. TURTLE LAKE (SE)	-22	-16	6	10	30	50	clear	clear
89. WEYBURN	-26	-22	10	15	16	25	clear	clear
90. WHITE BEAR	-10	+3	20	40	15	60	partly cloudy	partly cloudy
91. WHITEWOOD	-34	-27	0	10	10	40	clear	partly cloudy
92. YORKTON	-20	-20	5	10	60	100	heavy fog, moderate snow	

Table 2. COUNT COVERAGE

Locality	Km on foot	Hours on foot	Km by car	Hours by car	Hours at feeders	Evergreen	Mixedwood	Deciduous	Aspen farmland	Aspen prairie	Prairie	Tame grassland	Cultivated	Yards	Urban
1. ARCHERWILL	3	0.5	0	0	18								< 5	> 75	05-25
2. ARMIT	2	2	70	8			28-50	28-50					< 5	< 5	
3. ASSINIBOIA														> 75	
4. BANGOR	1.5	1	58	2	5				05-25	05-25	< 5	05-25	28-50	< 5	
5. BETHUNE															
6. BIGGAR	8	4.75	203	9.5	2				05-25				28-50	28-50	28-50
7. BIG RIVER	0.5	0.5	0	0	3	> 75									
8. BIRCH HILLS	3	2	94	4	2			05-25	28-50				28-50	< 5	05-25
9. BRIGHTWATER RES.	4	2	102	8				< 5	< 5	05-25	< 5	< 5	05-25	28-50	
10. BROADVIEW	2	1	128	6		< 5		05-25	28-50		05-25		28-50		05-25
11. BROMHEAD	0.5	0.5	180	8									> 75		
12. CANDLE LAKE	2	1.5	168	8	0.5	25	50	25							
13. CHITEK LAKE		1.5		3.5	1										
14. CIGAR LAKE						> 75									
15. CLARK'S CROSSING	15.7	14.8	450	19.4			< 5	< 5	05-25	05-25	< 5	< 5	28-50	28-50	05-25
Other (riparian)															
16. CORONACH	2	1	180	8							28-50		28-50	05-25	< 5
17. CRAVEN	9	4	280	12	9	< 5	< 5		28-50		05-25	< 5	05-25	05-25	05-25
Other < 5															
18. CROOKED LAKE	2	2	165	6	3		50		5					5	20
19. CROOKED RIVER	0.5	0.25	21	1	5			05-25					28-50	05-25	
20. CYPRESS HILLS PP	15	8	48	4	3	80	10				10			30	
21. DILKE	0	0	48	1	3				05-25		< 5		05-25		51-75
22. DUVAL	1	0.5	132	5	1				28-50	05-25	< 5		28-50	05-25	28-50
23. EASTEND						05-25			05-25		< 5		< 5		< 5
24. EMMA LAKE	1	1	55	4	4		> 75						< 5		
25. ENDEAVOUR	1.5	3	27	1.5	1			05-25		05-25			51-75		
26. FENTON			190	7.5	0.5			05-25	05-25		< 5		51-75	< 5	
27. FIFE LAKE	2	1	100	4							< 5		51-75	28-50	< 5
28. FT. QU'APPELLE	3	2	180	6	5			5	15	15			5	20	20
29. FORT WALSH	40	21.75	137	13.25			28-50				05-25		05-25	05-25	
Other 28-50 (riparian)															
30. GARDINER DAM	16	10	228	25.5	1				05-25		< 5		28-50	28-50	
Other 05-25 (riparian)															
31. GOOD SPIRIT L.	3	1.5	102	4.2	4	< 5	< 5	28-50	28-50	51-75	< 5	05-25	28-50	05-25	< 5
32. GOVENLOCK	16	8	300	13							51-75		28-50	28-50	
33. GRASSLANDS NP	3	2	200	5							51-75		05-25	05-25	
34. GRASSLANDS (NW)	1	2	77	2							28-50	05-25	05-25		
35. GRAYSON	1	1	40	3	2				28-50					28-50	< 5
36. HEPBURN			12	0.25	3				05-25						51-75
37. HOLBIEN					3										
38. HORSESHOE BEND	2	1			2										
39. HUMBOLDT	1	1	80	2.5	2				05-25					28-50	28-50
40. INDIAN HEAD	10	6	150	5	20				05-25	05-25	< 5	< 5	05-25	28-50	05-25
41. KAMSACK															
42. KELVINGTON			37	2	2				28				40	30	1
Other 1 (dump)															
43. KENASTON	2	1	160	4	0.5				28-50		05-25		05-25	< 5	< 5
44. KILWINNING	1	0.5	94	5		< 5		28-50	28-50	28-50			28-50	< 5	< 5
45. KINLOCH	5	2	94	3	8	05-25	05-25	05-25	05-25					05-25	
46. KUTAWAGAN L.	1	1	200	4							28-50		> 75		
47. KYLE			135	4.25					< 5	28-50	05-25		28-50	05-25	< 5
48. LARONGE	2	0.5	73	5	0.5		51-75								28-50
49. LAST MT. L. N.W.A	2	1	289	11							05-25	05-25	51-75	05-25	05-25
50. LEADER (North)	5	4	20	2	2						28-50		05-25	05-25	
51. LEADER (South)			204	6	2						05-25		51-75	05-25	05-25
52. LIVELONG					7										100
53. LOVE - TORCH R.	2	1	147	4	10	< 5	28-50						28-50	28-50	05-25
54. LUSELAND	4	3	78	3	6				51-75	< 5			28-50	< 5	05-25
55. MACDOWALL			40	2	3	< 5	< 5		05-25					51-75	
56. MARYFIELD	3	4	130	4				35	35	10			5	15	
57. MEADOW LAKE	7	2	130	4	3		05-25						05-25		28-50
58. MEATH PARK	2	1	54	4.5				28-50	05-25				05-25	05-25	

2. Count Coverage (continued).

Locality	Km on foot	Hours on foot	Km by car	Hours by car	Hours at feeders	Evergreen	Mixedwood	Deciduous	Aspen farmland	Aspen prairie	Prairie	Tame grassland	Cultivated	Yards	Urban	Water
ELFORT	3	1	45	2	3				5				75		20	
ELFORT (SE)						28-50			28-50					28-50		
ELVILLE	2	2	15	1	2		10		20				10	25	35	
OOSE JAW	10	4	21	3	4								< 5		28-50	
28-50 (riparian)																
OOSE MT.	2	1	137	4				51-75	05-25	05-25					05-25	
AICAM	0.5	0.5	111	3					21				50	25	4	
PAWIN					6										100	
KE LAKE	33.5	14.25	335.5	18	1.5			28-50	05-25	05-25			05-25	28-50		
PRINCE ALBERT	7	8.2	530	29	1	< 5	< 5	< 5					< 5	< 5	51-75	< 5
PRINCE ALBERT NP	28.5	16.5	111	6	5	05-25	28-50	05-25							05-25	< 5
JAPPELLE DAM	3	3	203	5.1				05-25	05-25	< 5	< 5	05-25	05-25	05-25	05-25	< 5
AYMORE	11	4	231	8	1					28-50			28-50	05-25	< 5	
EGINA	34	15	427	23	14			< 5	05-25	< 5	< 5	< 5	28-50	< 5	28-50	
OCKGLEN			50	1							< 5	05-25	51-75			
DUND L. (Q.V.)	2	1	182	6				05-25	05-25				< 5	05-25		05-25
DUND L. (P.A.)																
ASKLANDING PP	2	1	105	6							51-75		28-50	< 5		< 5
< 5 (riparian)																
ASKATOON	83.6	40.6	699.7	53.9	79.5	< 5	< 5	05-25	05-25	05-25	< 5	< 5	05-25	05-25	28-50	< 5
< 5 (landfill)																
COTT	5	2.75	211	6.25									28-50	28-50	05-25	
HAMROCK	1.5	0.75	73	2.5									75	10	15	
HAUNAVON		6			3									50	50	
CULL CREEK	4	3		8	5				28-50	28-50			05-25	28-50		
OWDEN	2.5	1.5	120	4	6.5		05-25						< 5	51-75	< 5	
ALDING	1	1	42	3	3		28-50							05-25	28-50	
FINNEY HILL	1	0.5	120	7		< 5	05-25	28-50	28-50	< 5			28-50	< 5	< 5	
QUAW RAPIDS	27	14	86	11		05-25	28-50	05-25					< 5	< 5		< 5
WIFT CURRENT	47	26	334	18.5	8						25	25	30	10	10	
SDALE			40	1		28-50		28-50					28-50			
RTLE LAKE (E)	5	1	40	3	3		51-75					05-25				
RTLE LAKE (SE)	4	8			24		51-75					< 5	< 5	< 5	< 5	
EYBURN	3	1.25	233	13.75	2	< 5	05-25	05-25	28-50	28-50	05-25	05-25	28-50	< 5	05-25	
HITE BEAR	3	3	37	1	0.5								51-75	28-50		
HITEWOOD	35	25	362	17	24				05-25			< 5	< 5	28-50	51-75	
ORKTON			35	3	4									05-25	51-75	< 5

1. ARCHERWILL
2. ARMIT
3. ASSINIBOIA
4. BANGOR
5. BETHUNE
6. BIGGAR
7. BIG RIVER
8. BIRCH HILLS
9. BRIGHTWATER RESERVOIR
10. BROADVIEW
11. BROMHEAD
12. CANDLE LAKE

13. CHITEK LAKE
14. CIGAR LAKE
15. CLARK'S CROSSING
16. CORONACH
17. CRAVEN
18. CROOKED LAKE
19. CROOKED RIVER
20. CYPRESS HILLS P.P.
21. DILKE
22. DUVAL
23. EASTEND
24. EMMA LAKE

25. ENDEAVOUR
26. FENTON
27. FIFE LAKE
28. FORT QU'APPELLE
29. FORT WALSH
30. GARDINER DAM
31. GOOD SPIRIT LAKE
32. GOVENLOCK
33. GRASSLANDS N. PARK
34. GRASSLANDS N. PARK
35. GRAYSON
36. HEPBURN
37. HOLBIEN
38. HORSESHOE BEND
39. HUMBOLDT
40. INDIAN HEAD
41. KAMSACK
42. KELVINGTON
43. KENASTON
44. KILWINNING
45. KINLOCH
46. KUTAWAGAN LAKE
47. KYLE
48. LAST MOUNTAIN LAKE N
49. LARONGE
50. LEADER (North)
51. LEADER (South)
52. LIVELONG
53. LOVE - TORCH RIVER
54. LUSELAND
55. MACDOWALL
56. MARYFIELD
57. MEADOW LAKE
58. MEATH PARK
59. MELFORT
60. MELFORT (SE)
61. MELVILLE
62. MOOSE JAW
63. MOOSE MOUNTAIN
64. NAICAM
65. NIPAWIN
66. PIKE LAKE
67. PRINCE ALBERT
68. PRINCE ALBERT N. PARK
69. QU'APPELLE VALLEY DA
70. RAYMORE
71. REGINA
72. ROCKGLEN - BORDERLA
73. ROUND LAKE (QU'APPEL
74. ROUND LAKE (P. A.)
75. SASK LANDING P. PARK
76. SASKATOON
77. SCOTT
78. SHAMROCK
79. SHAUNAVON
80. SKULL CREEK
81. SNOWDEN
82. SPALDING
83. SPINNEY HILL
84. SQUAW RAPIDS
85. SWIFT CURRENT
86. TISDALE
87. TURTLE LAKE (E)
88. TURTLE LAKE (SE)
89. WEYBURN
90. WHITE BEAR
91. WHITEWOOD
92. YORKTON

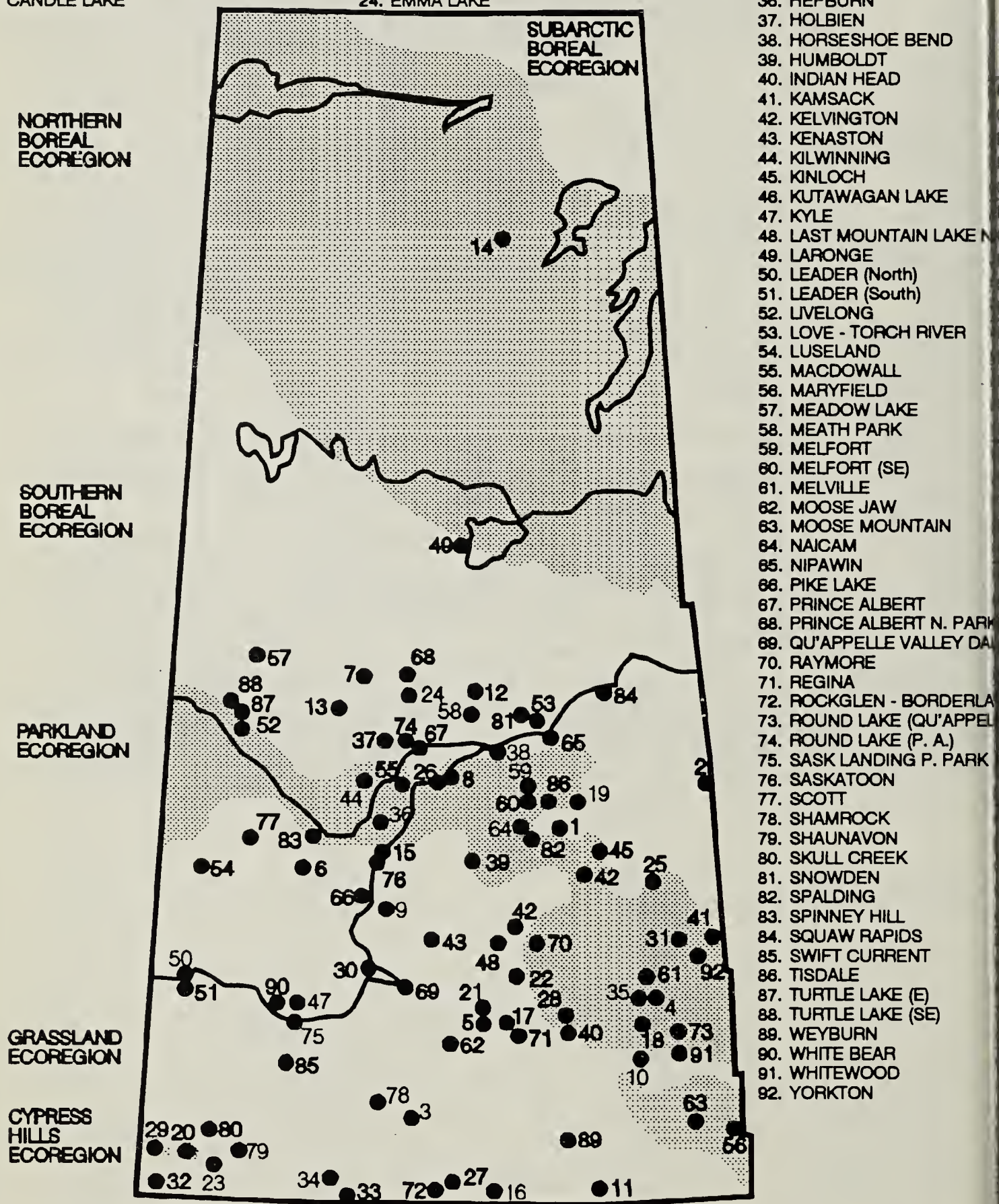


Figure 1. Location of 1996 counts (numbers correspond to locality names in Tables

Table 3-1. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES

+ = species seen during the count period but not on count day)

SPECIES	LOCATION AND DATE	1. ARCHERWILL 28 December 1996	2. ARMIT 3 January 1997	3. ASSINIBOIA 4 January 1997	4. BANGOR 5 January 1997	5. BETHUNE 4 January 1997	6. BIGGAR 28 December 1996	7. BIG RIVER 28 December 1996	8. BIRCH HILLS 20 December 1996	9. BRIGHTWATER R. 21 December 1996	10. BROADVIEW 27 December 1996
MALLARD											
COMMON GOLDENEYE											
BALD EAGLE											1
NORTHERN GOSHAWK			2								
GOLDEN EAGLE				3		2					
MERLIN						1	+		1		1
GRAY PARTRIDGE				143		20	28		4	8	
RING-NECKED PHEASANT											
SPRUCE GROUSE			1								
RUFFED GROUSE		2	5				+		1		1
SHARP-TAILED GROUSE			4	84		1	61			14	19
ROCK DOVE						8	136		1	2	2
GREAT HORNED OWL		1	1	2	+		1		1	1	2
SNOWY OWL				1	+	2			4	1	+
GREAT GRAY OWL											
DOWNY WOODPECKER		4	1		4	2	1		5	1	9
HAIRY WOODPECKER		6	2		4	2	2	1	4	1	3
THREE-TOED WOODPECKER											
NORTHERN FLICKER (Y-s)											
PILEATED WOODPECKER			2					1			1
HORNED LARK						6	20				
GRAY JAY		3						2			
BLUE JAY		17	7				2	4	5	+	4
BLACK-BILLED MAGPIE		14	18	55	6	3	148		39	31	75
COMMON RAVEN		4	78		+		11	5	15	4	31
BLACK-CAPPED CHICKADEE		30	5		32	3	45	4	52	7	40
OREAL CHICKADEE		3	1								
RED-BREASTED NUTHATCH		2			2		5	4		3	
WHITE-BREASTED NUTHATCH		4	1								1
AMERICAN ROBIN					1				7	2	
BOHEMIAN WAXWING							96		41	8	
REDAR WAXWING											
NORTHERN SHRIKE											1
EUROPEAN STARLING							2		4	2	
MARRIS' SPARROW											
MARK-EYED JUNCO					2				1	2	
SNOW BUNTING		150	727	35	+	24	657		66	81	75
PINE GROSBEAK		43	13		+		11	5	8		3
RED CROSSBILL			40				8			2	
WHITE-WINGED CROSSBILL			73								
COMMON REDPOLL			25	6			96		12	45	
GOOSEY REDPOLL							1				
PINE SISKIN											
EVENING GROSBEAK		47	20								
HOUSE SPARROW		50	5	207	15	28	478		295	157	84
TOTAL INDIVIDUALS COUNT DAY		381	1031	536	66	102	1809	26	566	371	354
NO. SPECIES COUNT DAY		17	23	9	8	13	20	8	20	20	19
NO. SPECIES COUNT PERIOD		17	23	9	17	13	22	8	20	21	20
NO. INDIVIDUALS IN TABLES 4 & 5		1	2	0	0	0	0	0	0	1	1
NO. SPECIES IN TABLES 4 & 5		1	2	0	4	0	0	0	0	1	1

Table 3-2. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES
 (+ = species seen during the count period but not on count day)

SPECIES	LOCATION AND DATE	11. BROMHEAD 5 January 1987	12. CANDLE LAKE 30 December 1986	13. CHITEK LAKE 23 December 1986	14. CIGAR LAKE 6 January 1987	15. CLARK'S CROSSING 21 December 1986	16. CORONACH 5 January 1987	17. CRAVEN 21 December 1986	18. CROOKED LAKE 21 December 1986	19. CROOKED RIVER 28 December 1986	20. CYPRESS HILLS P.P. 30 December 1986
MALLARD							2500		59		
COMMON GOLDENEYE							7				
BALD EAGLE											
NORTHERN GOSHAWK			1			2					
GOLDEN EAGLE		1					2		1		+
MERLIN								1			
GRAY PARTRIDGE		84				24	319	20			
RING-NECKED PHEASANT		95					3				4
SPRUCE GROUSE					1						
RUFFED GROUSE			+	1						3	
SHARP-TAILED GROUSE		39				11	48	13			33
ROCK DOVE						133	2	244	1		
GREAT HORNED OWL		2				2			1		+
SNOWY OWL		9				1	1	1			1
GREAT GRAY OWL						1					
DOWNY WOODDPECKER			3	2		4	1	13	4	3	6
HAIRY WOODPECKER			4	3		6		6	4	3	2
THREE-TOED WOODPECKER			1								
NORTHERN FLICKER (Y-s)								1			+
PILEATED WOODPECKER			1								
HORNED LARK		14					48	12			1
GRAY JAY			8	1							
BLUE JAY			1	9		1		20	12	6	
BLACK-BILLED MAGPIE		6	4	65		241	15	92	52	4	93
COMMON RAVEN			50	111	2	5			8	11	2
BLACK-CAPPED CHICKADEE			16	16		95	2	98	111	12	170
BOREAL CHICKADEE			5	4							
RED-BREASTED NUTHATCH			3	3				3			28
WHITE-BREASTED NUTHATCH								6	5		
AMERICAN ROBIN						1			33		
BOHEMIAN WAXWING						32		11			
CEDAR WAXWING								5			
NORTHERN SHRIKE			1	1							1
EUROPEAN STARLING		3				20			3		1
HARRIS' SPARROW								2			
DARK-EYED JUNCO						2		+			1
SNOW BUNTING				265		1197		111	47	33	263
PINE GROSBEAK			13	20		3		5	3	21	11
RED CROSSBILL											
WHITE-WINGED CROSSBILL			52								
COMMON REDPOLL											21
HOARY REDPOLL											+
PINE SISKIN				9							
EVENING GROSBEAK			1	39						44	8
HOUSE SPARROW		194				898	820	315	93	9	1
TOTAL INDIVIDUALS COUNT DAY		457	164	682	18	2680	3773	982	467	149	649
NO. SPECIES COUNT DAY		10	16	16	3	21	18	23	26	11	20
NO. SPECIES COUNT PERIOD		10	17	16	3	21	18	24	26	11	24
NO. INDIVIDUALS IN TABLES 4 & 5		0	1	133	15	1	9	3	30	0	2
NO. SPECIES IN TABLES 4 & 5		0	1	1	1	1	5	3	10	0	2

Table 3-3. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES

+ = species seen during the count period but not on count day)

21. DILKE 30 December 1986	22. DUVAL 26 December 1986	23. EASTEND 3 January 1987	24. EMMA LAKE 1 January 1987	25. ENDEAVOUR 24 December 1986	26. FENTON 4 January 1987	27. FIFE LAKE 2 January 1987	28. FT. QU'APPELLE 21 December 1986	29. FORT WALSH 21 December 1986	30. GARDINER DAM 23 December 1986	LOCATION AND DATE	SPECIES
						3	58	11	1350		MALLARD
						7	14		40		COMMON GOLDENEYE
		1					1	4	14		BALD EAGLE
				+				1			NORTHERN GOSHAWK
+		1						2	5		GOLDEN EAGLE
								+			MERLIN
6	11	16				162	2	27	110		GRAY PARTRIDGE
		4				2	2	3			RING-NECKED PHEASANT
											SPRUCE GROUSE
			2	2	2		+				RUFFED GROUSE
+	7					46	7	17	11		SHARP-TAILED GROUSE
2	26			3		5	+	2	47		ROCK DOVE
					1		1	1	3		GREAT HORNED OWL
					1	2	+		2		SNOWY OWL
				1							GREAT GRAY OWL
	6		5	1	4		12	1	1		DOWNY WOODPECKER
+	2		3	2	8		11	5	1		HAIRY WOODPECKER
								3			THREE-TOED WOODPECKER
											NORTHERN FLICKER (Y-8)
				1							PILEATED WOODPECKER
6	5	6				52	+	3	23		HORNED LARK
			1								GRAY JAY
1	11	3	15	4	1		31		10		BLUE JAY
1	37	8	3	11	62	1	92	182	135		BLACK-BILLED MAGPIE
	+		141	50	15		3	4	6		COMMON RAVEN
4	24	11	96	25	61		177	34	13		BLACK-CAPPED CHICKADEE
			12								BOREAL CHICKADEE
			12				1	3	1		RED-BREASTED NUTHATCH
			9	1	1		18				WHITE-BREASTED NUTHATCH
							3				AMERICAN ROBIN
	150				214		12		42		BOHEMIAN WAXWING
											CEDAR WAXWING
							1	2			NORTHERN SHRIKE
	4						2		5		EUROPEAN STARLING
											HARRIS' SPARROW
							1	4			DARK-EYED JUNCO
30	13			150	386		24	244	237		SNOW BUNTING
			15	20	48		20	2	10		PINE GROSBEAK
									3		RED CROSSBILL
			+								WHITE-WINGED CROSSBILL
				5	68		8	22			COMMON REDPOLL
							+				HOARY REDPOLL
							7		1		PINE SISKIN
			7	42	2						EVENING GROSBEAK
8	384	6			14	19	218	114	350		HOUSE SPARROW
58	680	56	321	320	888	300	741	742	2591		TOTAL INDIVIDUALS COUNT DAY
8	13	9	13	17	16	11	31	30	31		NO. SPECIES COUNT DAY
11	14	9	14	18	16	11	39	31	31		NO. SPECIES COUNT PERIOD
0	0	0	0	2	0	1	15	54	171		NO. INDIVIDUALS IN TABLES 4 & 5
0	0	0	0	2	0	1	9	9	9		NO. SPECIES IN TABLES 4 & 5

Table 3-4. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES
(+ = species seen during the count period but not on count day)

SPECIES	LOCATION AND DATE	31. GOOD SPIRIT L 28 December 1986	32. GOVENLOCK 22 December 1986	33. GRASSLANDS N.P. 29 December 1986	34. GRASSLANDS (NW) 20 December 1986	35. GRAYSON 23 December 1986	36. HEPBURN 31 December 1986	37. HOLBIEN 26 December 1986	38. HORSESHOE BEND 30 December 1986	39. HUMBOLDT 29 December 1986	40. INDIAN HEAD 28 December 1986
MALLARD						41					30
COMMON GOLDENEYE											2
BALD EAGLE											2
NORTHERN GOSHAWK										1	1
GOLDEN EAGLE			1	2							
MERLIN			1								1
GRAY PARTRIDGE		9	24	17	1						
RING-NECKED PHEASANT			1	8							
SPRUCE GROUSE											
RUFFED GROUSE		+							6	1	7
SHARP-TAILED GROUSE			6	7	9	7				+	8
ROCK DOVE		4		3	14	2	+			300	62
GREAT HORNED OWL		+	5	1					+	+	1
SNOWY OWL			3								3
GREAT GRAY OWL											
DOWNY WOODPECKER		8				4	+	2		4	11
HAIRY WOODPECKER		9			1	5	+			6	14
THREE-TOED WOODPECKER											
NORTHERN FLICKER (Y-s)											
PILEATED WOODPECKER		1									
HORNED LARK			284	169	12					3	2
GRAY JAY											
BLUE JAY		7					1	3	2	3	11
BLACK-BILLED MAGPIE		14	10	38	28	18	1		1	38	55
COMMON RAVEN		12				4	1		4	2	15
BLACK-CAPPED CHICKADEE		51	1		7	38	3	12	14	18	98
BOREAL CHICKADEE								2			
RED-BREASTED NUTHATCH							2			2	28
WHITE-BREASTED NUTHATCH		3					+				10
AMERICAN ROBIN					1	2					4
BOHEMIAN WAXWING							+			79	
CEDAR WAXWING											
NORTHERN SHRIKE			2	1		1					
EUROPEAN STARLING		10	11								
HARRIS' SPARROW											
DARK-EYED JUNCO											14
SNOW BUNTING		82	243	602	54	6			80	126	600
PINE GROSBEAK		42			1		+	8		12	7
RED CROSSBILL											
WHITE-WINGED CROSSBILL		25									
COMMON REDPOLL								10		23	
HOARY REDPOLL											
PINE SISKIN											4
EVENING GROSBEAK		+						18	6		
HOUSE SPARROW		70	267	165	55	10	15	1		63	201
TOTAL INDIVIDUALS COUNT DAY		347	876	1044	183	147	23	56	113	681	1199
NO. SPECIES COUNT DAY		15	18	13	11	15	6	8	7	16	28
NO. SPECIES COUNT PERIOD		18	18	13	11	15	12	8	8	18	28
NO. INDIVIDUALS IN TABLES 4 & 5		0	17	31	0	9	0	0	0	0	6
NO. SPECIES IN TABLES 4 & 5		0	4	2	0	3	0	0	0	0	3

Table 3-5. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES

(+ = species seen during the count period but not on count day)

41. KAMSACK 26 December 1986	42. KELVINGTON 28 December 1986	43. KENASTON 2 January 1987	44. KILWINNING 20 December 1986	45. KINLOCH 2 January 1987	46. KUTAWAGAN LAKE 27 December 1986	47. KYLE 26 December 1986	48. LAST MT. L. NWA 26 December 1986	49. LA RONGE 26 December 1986	50. LEADER (N) 28 December 1986	LOCATION AND DATE	SPECIES
								2			MALLARD
											COMMON GOLDENEYE
											BALD EAGLE
					1						NORTHERN GOSHAWK
1									1		GOLDEN EAGLE
											MERLIN
		24	5		58	53	126		7		GRAY PARTRIDGE
									25		RING-NECKED PHEASANT
											SPRUCE GROUSE
	6		2	3							RUFFED GROUSE
30	+	14	10		29	2	149		9		SHARP-TAILED GROUSE
		134	12	9			182		1		ROCK DOVE
2				1	2		+				GREAT HORNED OWL
1		1			1		4				SNOWY OWL
											GREAT GRAY OWL
19	2		3	3	1						DOWNY WOODPECKER
24	4		1	8	2			2			HAIRY WOODPECKER
				1							THREE-TOED WOODPECKER
			1								NORTHERN FLICKER (Y-s)
2											PILEATED WOODPECKER
		2			1		7				HORNED LARK
				9				5			GRAY JAY
30	2	3	4	12				2	4		BLUE JAY
11	19	29	23	1	50	8	50		6		BLACK-BILLED MAGPIE
14	14		15	5				144			COMMON RAVEN
51	28	2	13	44			3	14			BLACK-CAPPED CHICKADEE
			1					4			BOREAL CHICKADEE
6			1	2							RED-BREASTED NUTHATCH
5	1			5							WHITE-BREASTED NUTHATCH
											AMERICAN ROBIN
50		26			11				25		BOHEMIAN WAXWING
											CEDAR WAXWING
		1	1				+				NORTHERN SHRIKE
			1						4		EUROPEAN STARLING
2											HARRIS' SPARROW
8						2			1		DARK-EYED JUNCO
100	120	26	145	255	218	70	425		60		SNOW BUNTING
186	17		33	46	2			19			PINE GROSBEAK
											RED CROSSBILL
			10								WHITE-WINGED CROSSBILL
	26	120	472	3			+	9			COMMON REDPOLL
			7				+				HOARY REDPOLL
5											PINE SISKIN
287	20		12	24				10			EVENING GROSBEAK
50		59	110	7	504	4	309		6		HOUSE SPARROW
884	259	441	882	438	880	140	1255	212	149		TOTAL INDIVIDUALS COUNT DAY
21	12	13	22	18	13	7	9	11	12		NO. SPECIES COUNT DAY
21	13	13	22	18	13	7	13	11	12		NO. SPECIES COUNT PERIOD
0	0	0	0	1	0	1	0	1	0		NO. INDIVIDUALS IN TABLES 4 & 5
0	0	0	0	1	0	1	0	1	0		NO. SPECIES IN TABLES 4 & 5

Table 3-6. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES
(+ = species seen during the count period but not on count day)

SPECIES	LOCATION AND DATE	51. LEADER (S) 1 January 1987	52. LIVE LONG 3 January 1987	53. LOVE - TORCH R. 2 January 1987	54. LUSELAND 5 January 1987	55. MACDOWALL 3 January 1987	56. MARYFIELD 26 December 1986	57. MEADOW LAKE 26 December 1986	58. MEATH PARK 4 January 1987	59. MELFORT 26 December 1986
MALLARD										
COMMON GOLDENEYE										
BALD EAGLE										
NORTHERN GOSHAWK								1		
GOLDEN EAGLE		1								
MERLIN										
GRAY PARTRIDGE		134			59	+	20			
RING-NECKED PHEASANT		4					2			
SPRUCE GROUSE				1						
RUFFED GROUSE			2	1			1			
SHARP-TAILED GROUSE		8		1	+		6			
ROCK DOVE			35	15	17	25	2	70		40
GREAT HORNED OWL					+		1			
SNOWY OWL		5			4		1			2
GREAT GRAY OWL				1					1	
DOWNY WOODPECKER		1	2	1	1	2		2		
HAIRY WOODPECKER			2	7	2	2		2		
THREE-TOED WOODPECKER										
NORTHERN FLICKER (Y-s)					1					
PILEATED WOODPECKER										
HORNED LARK		12					5			
GRAY JAY				12		2				
BLUE JAY		6	5	15	6	2				1
BLACK-BILLED MAGPIE		40	1	28	18	4	6	11	7	4
COMMON RAVEN			3	94		9	2	64	3	5
BLACK-CAPPED CHICKADEE		1	20	45	11	30	2	23	7	6
BOREAL CHICKADEE				+				5		
RED-BREASTED NUTHATCH		1		2	6	4		3		
WHITE-BREASTED NUTHATCH			+	4						2
AMERICAN ROBIN							1			
BOHEMIAN WAXWING			+		+		15	11	2	310
CEDAR WAXWING		20		1						
NORTHERN SHRIKE		1	+					1		
EUROPEAN STARLING		7						2		
HARRIS' SPARROW										
DARK-EYED JUNCO			+					3		
SNOW BUNTING		30	+	52	27	100	73	54		25
PINE GROSBEAK			40	30	21	2		77		
RED CROSSBILL										
WHITE-WINGED CROSSBILL				2						
COMMON REDPOLL			25	333	1			146		
HOARY REDPOLL				2						
PINE SISKIN			+							
EVENING GROSBEAK			4	142		2		26		
HOUSE SPARROW		75		65	62		25	144	9	28
TOTAL INDIVIDUALS COUNT DAY		369	139	854	236	184	162	645	29	423
NO. SPECIES COUNT DAY		16	11	22	14	12	15	18	6	10
NO. SPECIES COUNT PERIOD		16	17	23	18	13	15	18	6	10
NO. INDIVIDUALS IN TABLES 4 & 5		23	0	0	0	0	0	0	0	0
NO. SPECIES IN TABLES 4 & 5		1	0	0	1	0	0	0	0	0

Table 3-7. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES
(+ = species seen during the count period but not on count day)

60. MELFORT (SE) 28 December 1986	61. MELVILLE 24 December 1986	62. MOOSE JAW 26 December 1986	63. MOOSE MOUNTAIN 20 December 1986	64. NAICAM 3 January 1987	65. NIPAWIN 5 January 1987	66. PIKE LAKE 4 January 1987	67. PRINCE ALBERT 22 December 1986	68. PRINCE ALBERT NP 29 December 1986	LOCATION AND DATE
									MALLARD
									COMMON GOLDENEYE
									BALD EAGLE
						2		1	NORTHERN GOSHAWK
									GOLDEN EAGLE
		1							MERLIN
6		57		16		38			GRAY PARTRIDGE
		6							RING-NECKED PHEASANT
								5	SPRUCE GROUSE
						1	+	4	RUFFED GROUSE
		4	1			123			SHARP-TAILED GROUSE
	30	300	20			22	480		ROCK DOVE
	+	2				4	3		GREAT HORNED OWL
1		3					1		SNOWY OWL
									GREAT GRAY OWL
1	2	4	2		2	22	9	1	DOWNY WOODPECKER
1	2	1	7		3	18	12	4	HAIRY WOODPECKER
								5	THREE-TOED WOODPECKER
						1			NORTHERN FLICKER (Y-3)
						+			PILEATED WOODPECKER
									HORNED LARK
							2	3	GRAY JAY
2		6	18		4	33	12		BLUE JAY
7	5	28	60	12	1	343	102	6	BLACK-BILLED MAGPIE
8	2		8	4	8	17	233	10	COMMON RAVEN
3	25	42	33	7	11	219	79	23	BLACK-CAPPED CHICKADEE
								52	BOREAL CHICKADEE
		28			3	2	6	2	RED-BREASTED NUTHATCH
		7	1			6	2	1	WHITE-BREASTED NUTHATCH
		3	1			114	1		AMERICAN ROBIN
50				42	+	689	172		BOHEMIAN WAXWING
						4			CEDAR WAXWING
		+				1	1		NORTHERN SHRIKE
		75	2			25			EUROPEAN STARLING
									HARRIS' SPARROW
		11			+	2	2		DARK-EYED JUNCO
	+	+		193		314	1051	2	SNOW BUNTING
		12	3		7	237	239	6	PINE GROSBEAK
							14	1	RED CROSSBILL
						1	8	94	WHITE-WINGED CROSSBILL
2		6			+	22	210	26	COMMON REDPOLL
									HOARY REDPOLL
		6			+		2	6	PINE SISKIN
					15		160	3	EVENING GROSBEAK
100	10	310	38			312	99		HOUSE SPARROW
181	76	978	194	274	54	2586	2902	255	TOTAL INDIVIDUALS COUNT DAY
11	7	24	13	6	9	28	25	20	NO. SPECIES COUNT DAY
11	9	27	13	6	13	29	26	20	NO. SPECIES COUNT PERIOD
0	0	68	0	0	0	4	1	5	NO. INDIVIDUALS IN TABLES 4 & 5
0	0	4	0	0	0	2	1	1	NO. SPECIES IN TABLES 4 & 5

Table 3-8. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES
(+ = species seen during the count period but not on count day)

SPECIES	LOCATION AND DATE	69. QU'APPELLE DAM 5 January 1997	70. RAYMORE 25 December 1996	71. REGINA 26 December 1996	72. ROCKGLEN 5 January 1997	73. ROUND LAKE (Q.V.) 2 January 1997	74. ROUND LAKE (P.A.) 22 December 1996	75. SK LANDING P.P. 24 December 1996	76. SASKATOON 26 December 1996	77. SCOTT 31 December 1996
MALLARD		19				3			3	
COMMON GOLDENEYE		2							23	
BALD EAGLE						+		1		
NORTHERN GOSHAWK		+	+	1				1		1
GOLDEN EAGLE						+		4		
MERLIN				2					1	
GRAY PARTRIDGE		29	+	96	10			47	70	52
RING-NECKED PHEASANT										
SPRUCE GROUSE										
RUFFED GROUSE			1				3		1	
SHARP-TAILED GROUSE		33	2	7	65	5		10	22	20
ROCK DOVE		5	+	368		19		3	940	23
GREAT HORNED OWL		1	1	2		1	1	1	3	
SNOWY OWL		4		4				1	+	2
GREAT GRAY OWL							1			
DOWNY WOODDPECKER			1	7		4	2	1	28	
HAIRY WOODPECKER		1	2	5		4	2		28	
THREE-TOED WOODPECKER		1								
NORTHERN FLICKER (Y-9)				1					7	
PILEATED WOODPECKER										
HORNED LARK			+		5			6	18	16
GRAY JAY										
BLUE JAY		3	+	2		13			49	1
BLACK-BILLED MAGPIE		120	44	215	7	22		36	411	66
COMMON RAVEN		2	2			8	1		8	1
BLACK-CAPPED CHICKADEE		14	5	25		103	11	2	354	18
BOREAL CHICKADEE										
RED-BREASTED NUTHATCH			+	47					97	2
WHITE-BREASTED NUTHATCH				6		12	1		5	
AMERICAN ROBIN		1		2		2			45	
BOHEMIAN WAXWING		73	15		8	90		7	124	42
CEDAR WAXWING									97	
NORTHERN SHRIKE			+			1				1
EUROPEAN STARLING		4		55					34	
HARRIS' SPARROW				1					1	
DARK-EYED JUNCO		1	+	14					13	
SNOW BUNTING		95	435	170		+	50	155	460	289
PINE GROSBEAK		20	7	1		4	10		73	5
RED CROSSBILL			+	21					91	
WHITE-WINGED CROSSBILL				12					53	
COMMON REDPOLL			50	8		76	30		202	
HOARY REDPOLL										
PINE SISKIN				9					33	
EVENING GROSBEAK						1	80			
HOUSE SPARROW		242	79	1058		10	1	137	1296	156
TOTAL INDIVIDUALS COUNT DAY		672	644	2388	95	379	193	412	4617	695
NO. SPECIES COUNT DAY		22	13	35	5	19	13	15	37	16
NO. SPECIES COUNT PERIOD		23	23	36	5	23	13	16	40	16
NO. INDIVIDUALS IN TABLES 4 & 5		3	0	249	0	1	0	0	27	0
NO. SPECIES IN TABLES 4 & 5		3	1	10	0	2	0	1	8	0

Table 3-9. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES
(+ = species seen during the count period but not on count day)

78. SHAMROCK 28 December 1996	79. SHAUNAVON 4 January 1997	80. SKULL CREEK 28 December 1996	81. SNOWDEN 4 January 1997	82. SPALDING 4 January 1997	83. SPINNEY HILL 3 January 1997	84. SQUAW RAPIDS 2 January 1997	85. SWIFT CURRENT 29 December 1996	86. TISDALE 24 December 1996	LOCATION AND DATE	SPECIES
						14				MALLARD
						141				COMMON GOLDENEYE
		1				12				BALD EAGLE
		2				2				NORTHERN GOSHAWK
1		1					2			GOLDEN EAGLE
							1			MERLIN
97	32	109	4		+		215			GRAY PARTRIDGE
		6					16			RING-NECKED PHEASANT
			2			6				SPRUCE GROUSE
			8	1	+	8				RUFFED GROUSE
6		86			+	32	40			SHARP-TAILED GROUSE
	4	17					54			ROCK DOVE
3	2	11				2	1			GREAT HORNED OWL
2	2				1		1			SNOWY OWL
			2			2				GREAT GRAY OWL
	2	9	9	1	2	1	4			DOWNY WOODPECKER
	2	6	10	1	1	5	2			HAIRY WOODPECKER
						1				THREE-TOED WOODPECKER
		1					1			NORTHERN FLICKER (Y-a)
			+			1				PILEATED WOODPECKER
		44			2		62			HORNED LARK
			19			1				GRAY JAY
	3	1	30	2	9	17	3			BLUE JAY
14	36	197	46	1	51	25	44	4		BLACK-BILLED MAGPIE
			112	2	6	69		10		COMMON RAVEN
	12	111	137	5	49	19	6	5		BLACK-CAPPED CHICKADEE
			14							BOREAL CHICKADEE
	3		5	+			14			RED-BREASTED NUTHATCH
			4				1			WHITE-BREASTED NUTHATCH
	1	4					5			AMERICAN ROBIN
	17	49		50	30		331			BOHEMIAN WAXWING
		75					36			CEDAR WAXWING
	1	1				1	+			NORTHERN SHRIKE
		6	3				1			EUROPEAN STARLING
		4								HARRIS' SPARROW
		4				1	2			DARK-EYED JUNCO
		663	282		222	305	372			SNOW BUNTING
		19	111	2	67		46			PINE GROSBEAK
							+			RED CROSSBILL
						2	+			WHITE-WINGED CROSSBILL
		48	316		+	60	1			COMMON REDPOLL
										HOARY REDPOLL
										PINE SISKIN
			238		+	1				EVENING GROSBEAK
80	200	257	58	5	4	10	661	20		HOUSE SPARROW
203	318	1785	1410	70	444	751	1952	39		TOTAL INDIVIDUALS COUNT DAY
7	15	31	20	10	12	28	29	4		NO. SPECIES COUNT DAY
7	15	34	21	11	18	28	32	4		NO. SPECIES COUNT PERIOD
0	1	53	0	0	0	14	30	0		NO. INDIVIDUALS IN TABLES 4 & 5
0	1	8	0	0	1	5	3	0		NO. SPECIES IN TABLES 4 & 5

Table 3-10. SPECIES RECORDED FROM MORE THAN SIX LOCALITIES
 (+ = species seen during the count period but not on count day)

SPECIES	LOCATION AND DATE	87. TURTLE L (E) 1 January 1997	88. TURTLE L (SE) 2 January 1997	89. WEYBURN 21 December 1998	90. WHITE BEAR 1 January 1997	91. WHITEWOOD 22 December 1998	92. YORKTON 3 January 1997	Total Individuals Count Day	Number of Counts Count Period	Number of Counts Count Day
MALLARD							4	4095	13	13
COMMON GOLDENEYE							2	240	10	10
BALD EAGLE		7	1	1				47	13	12
NORTHERN GOSHAWK						2		22	19	16
GOLDEN EAGLE					+			31	21	17
MERLIN				2	+			13	14	11
GRAY PARTRIDGE				111	29	2	3	2552	51	48
RING-NECKED PHEASANT				8	1			190	17	17
SPRUCE GROUSE		2						18	7	7
RUFFED GROUSE		4				2	1	82	35	29
SHARP-TAILED GROUSE		6		129	9	13		1321	55	50
ROCK DOVE			5	354	164	64	284	4677	55	52
GREAT HORNED OWL		1		2	1	3		78	48	40
SNOWY OWL		1	+	1				75	40	35
GREAT GRAY OWL		4	4					17	9	9
DOWNY WOODPECKER		10	3	4		8	5	303	66	65
HAIRY WOODPECKER		6	2	2		8	4	315	67	65
THREE-TOED WOODPECKER			1					13	7	7
NORTHERN FLICKER (Y-s)				1				15	10	9
PILEATED WOODPECKER		2						12	11	9
HORNED LARK					12	+		856	33	30
GRAY JAY		10	6					84	15	15
BLUE JAY		15	11	1	10	3	16	547	65	63
BLACK-BILLED MAGPIE		5	14	23	41	107	44	4149	87	87
COMMON RAVEN		15	50			15	46	1601	63	61
BLACK-CAPPED CHICKADEE		25	128	8	2	167	55	3429	82	82
BOREAL CHICKADEE		4	5					112	14	13
RED-BREASTED NUTHATCH			2	5		5	15	361	41	39
WHITE-BREASTED NUTHATCH			6	1		3	2	134	33	31
AMERICAN ROBIN				1			2	237	23	23
BOHEMIAN WAXWING				35	+	+	225	3194	42	36
CEDAR WAXWING						+	167	405	9	8
NORTHERN SHRIKE						+		22	26	20
EUROPEAN STARLING			1	128	+	1	4	420	30	30
HARRIS' SPARROW					1	+	2	13	8	7
DARK-EYED JUNCO			1	6	2		10	110	29	26
SNOW BUNTING		40		28	125	1775	151	15565	71	67
PINE GROSBEAK		75	129	+		3	40	1933	60	57
RED CROSSBILL			7					187	11	9
WHITE-WINGED CROSSBILL			25	2				360	15	13
COMMON REDPOLL		75	40	+	+	23	18	2689	44	39
HOARY REDPOLL		10					1	21	8	5
PINE SISKIN			2	+				84	14	11
EVENING GROSBEAK		10	11			+		1280	32	29
HOUSE SPARROW			59	560	200	571	310	13909	76	76
TOTAL INDIVIDUALS COUNT DAY		327	513	1451	597	2794	1415	66874		
NO. SPECIES COUNT DAY		21	23	26	13	23	29			
NO. SPECIES COUNT PERIOD		21	25	34	21	30	30			
NO. INDIVIDUALS IN TABLES 4 & 5		0	1	38	0	19	24			
NO. SPECIES IN TABLES 4 & 5		0	2	8	3	5	6			

Table 4. SPECIES SEEN ON SIX OR FEWER COUNTS

SPECIES	LOCATION AND NUMBER
ARCTIC TUNDRA SWAN	Crooked Lake, 1; Grayson, 1; Indian Head, 2
AMERICAN WHITE PELICAN	Gardiner Dam, 1
SNOW GOOSE	Weyburn, +
CANADA GOOSE	Coronach, 2; Fort Qu'appelle, 6; Regina, 150; Saskatoon, 6
GREEN-WINGED TEAL	Crooked Lake, 2
NORTHERN PINTAIL	Coronach, 1; Crooked Lake, 4; Fort Qu'appelle, 1; Grayson, 7
BLUE-WINGED TEAL	
SAFWALL	Crooked Lake, 1; Gardiner Dam, 1
AMERICAN WIGEON	Fife Lake, 1
CANVASBACK	Crooked Lake, 2; Fort Qu'appelle, 1
REDHEAD	Fort Qu'appelle, 4; Gardiner Dam, 1; Round Lake (Qu'appelle Valley), 1
LESSER SCAUP	Crooked Lake, 12; Fort Qu'appelle, 1; Gardiner Dam, 3
BARROW'S GOLDENEYE	Squaw Rapids, 1
DUCKBILL	Crooked Lake, 2; Fort Qu'appelle, 2
HOODED MERGANSER	Crooked Lake, 1
COMMON MERGANSER	Gardiner Dam, 160; Squaw Rapids, 10
TURKEY VULTURE	Yorkton, 1
HARP-SHINNED HAWK	Archerwill, 1; Craven, 1
COOPER'S HAWK	Weyburn, 1
RED-TAILED HAWK	Raymore, +
ROUGH-LEGGED HAWK	Bangor, +; Saskatoon, +
GYRFALCON	Bangor, 1; Gardiner Dam, 2; Kyle, 1; Saskatchewan Landing P.P., +; White Bear, +
RAIRIE FALCON	Coronach, 1; Grassland N.P., 1; Skull Creek, 1; White Bear, +
WILLOW PTARMIGAN	Cigar Lake, 15
AGE GROUSE	Govenlock, 3
WILD TURKEY	Fort Walsh, 6
AMERICAN COOT	Coronach, 4
NORTHERN HAWK-OWL	Craven, 1; Fort Qu'appelle, +; Prince Albert, 1; Skull Creek, +; Whitewood, 1
BARRED OWL	Armit, 1
NORTH-EARED OWL	Fort Qu'appelle, +; Govenlock, 12; Luseland, +
NOREAL OWL	Broadview, 1; Endeavor, 1; Pike Lake, 1
NORTHERN SAW-WHET OWL	Bangor, +; Skull Creek, 2; Weyburn, +; White Bear, +
BLACK-BACKED WOODPECKER	Armit, 1; Squaw Rapids, 1; Turtle Lake (SE), +
NORTHERN FLICKER (R-s)	Regina, +
AMERICAN CROW	Moose Jaw, 3; Regina, 3; Saskatoon, 3; Skull Creek, +; Whitewood, +; Yorkton, 1
MOUNTAIN CHICKADEE	Cypress Hills P.P., 1
BROWN CREEPER	Fort Qu'appelle, +; Regina, 4; Saskatoon, 2; Shaunavon, 1; Weyburn, +; Yorkton, +
GOLDEN-CROWNED KINGLET	Moose Jaw, +; Saskatoon, 1
OWNSEND'S SOLITAIRE	Crooked Lake, 1; Regina, 1; Round lake (Qu'appelle Valley), +; Saskatoon, +
AMERICAN TREE SPARROW	Bangor, +; Fort Walsh, 3; Skull Creek, 5
ARK BUNTING	Moose Jaw, 1
OX SPARROW	Regina, 1
ONG SPARROW	Fort Walsh, 2
NCOLN'S SPARROW	Gardiner Dam, 1
HITE-THROATED SPARROW	Endeavor, 1; Saskatoon, 1; Swift Current, 7
HITE-CROWNED SPARROW	Craven, 1
APLAND LONGSPUR	Govenlock, 1; Grasslands N.P., 30; Weyburn, 21; Whitewood, 15
RED-WINGED BLACKBIRD	Clark's Crossing, 1; Fort Walsh, 12; Indian Head, 1; Qu'appelle Valley Dam, 1; Whitewood, 1
WESTERN MEADOWLARK	Skull Creek, +
JUSTY BLACKBIRD	Coronach, 1; Fort Walsh, 12; Govenlock, 1; Regina, 3; Skull Creek, 15; Spinney Hill, +
REWER'S BLACKBIRDRD	Cypress Hills P.P., 1 Fort Walsh, 2; Indian Head, 3; Pike Lake, 3; Yorkton, 20
COMMON GRACKLE	Crooked Lake, 4; LaRonge, 1; Regina, 7; Weyburn, +; Yorkton, 1
BROWN-HEADED COWBIRD	Whitewood, 2
OSY FINCH	Fort Walsh, 2; Skull Creek, 30
PURPLE FINCH	Regina, 2; Swift Current, 1; Weyburn, +
HOUSE FINCH	Moose Jaw, 64; Regina, 78; Saskatoon, 14; Swift Current, 22; Weyburn, 16

Table 5. BIRDS NOT IDENTIFIED TO SPECIES

SPECIES	LOCATION AND NUMBER
EAGLE species	Gardiner Dam, 1
LARGE FALCON species	Brightwater Reservoir, 1; Yorkton, 1
HAWK species	Qu'appelle Valley Dam, 1
WOODPECKER species	Gardiner Dam, 1; Squaw Rapids, 1
REDPOLL species	Chitek Lake, 133; Fort Walsh, 12
BIRD species	Leader (S), 23

Table 6. SUMMARY OF NEW OR TYING HIGH COUNTS ESTABLISHED DURING THE 1996 COUNTS (tying counts regular type; boldface/italic indicates a new record)

LOCATION	1996 COUNT	SPECIES	PREVIOUS HIGH	LOCATION
Grayson	7	Northern Pintail	4	Saskatoon (79)
Squaw Rapids	1	Barrow's Goldeneye	New	
Weyburn	1	Cooper's Hawk	1	N. To Battleford
Broadview, Endeavour, Pike Lake	1	Boreal Owl	1	S. To Broadview, Indian Head
Cypress Hills P.P.	1	Mountain Chickadee	1	N. To Marsden
Moose Jaw	1	Lark Bunting	New	
Regina	1	Fox Sparrow	1	N. To Kamsack
Gardiner Dam	1	Lincoln's Sparrow	1	Broadview (95)
Swift Current	7	White-throated Sparrow	5	Indian Head (87)
Regina	7	Common Grackle	3	Weyburn (87), Regina (87)
Regina	78	House Finch	44	Moose Jaw (95)

Table 7. COMPARISON OF THE 1996 POPULATIONS TO 1995 AND AVERAGE PAST YEARS (1991-1995) BASED ON PARTY HOURS PER INDIVIDUAL BIRD SEEN

SPECIES	96 vs 95	96 vs 5yr	SPECIES	96 vs 95	96 vs 5yr
ADA GOOSE	-488.7	-1119.9	COMMON RAVEN	+15.7	+34.5
LARD	-185.9	+58.8	BLACK-CAPPED CHICKADEE	+4.7	+199.7
MON GOLDENEYE	-147.8	-308.3	BOREAL CHICKADEE	+5.0	-76.6
D EAGLE	+32.7	-137.1	RED-BREASTED NUTHATCH	-75.2	-43.6
THERN GOSHAWK	+43.4	-71.5	WHITE-BREASTED NUTHATCH	-41.6	-100.4
DEN EAGLE	+4.2	-148.5	BROWN CREEPER	+17.9	-74.2
LIN	+4.2	-98.2	GOLDEN-CROWNED KINGLET	-1625.0	-2571.7
RIE FALCON	+38.1	-232.2	AMERICAN ROBIN	+70.9	-9.6
Y PARTRIDGE	+25.7	+157.4	BOHEMIAN WAXWING	-51.2	+74.8
G-NECKED PHEASANT	+39.5	-43.7	CEDAR WAXWING	+36.8	-134.5
UCE GROUSE	+36.1	-80.3	NORTHERN SHRIKE	+12.9	-120.0
FED GROUSE	-27.4	-100.7	EUROPEAN STARLING	-37.1	-55.8
RP-TAILED GROUSE	+3.2	+28.3	AMERICAN TREE SPARROW	-139.6	-274.5
K DOVE	-22.9	+250.1	DARK-EYED JUNCO	-281.6	-160.8
AT HORNED OWL	-6.9	-123.5	LAPLAND LONGSPUR	-6142.0	-2137.6
WY OWL	+25.9	-98.8	SNOW BUNTING	+1.4	+1142.5
RT-EARED OWL	+92.0	-89.8	RED-WINGED BLACKBIRD	+76.0	-99.5
NY WOODPECKER	+2.9	-85.8	RUSTY BLACKBIRD	-81.7	-107.0
Y WOODPECKER	-3.1	-85.8	PINE GROSBEAK	+3.9	+99.0
EE-TOED WOODPECKER	+41.0	-57.6	RED CROSSBILL	+82.1	+0.4
THERN FLICKER	-110.8	-209.5	WHITE-WINGED CROSSBILL	-268.4	-97.8
ATED WOODPECKER	-27.8	-200.8	COMMON REDPOLL	-181.6	+52.4
NED LARK	-304.4	-289.3	HOARY REDPOLL	-456.7	-516.2
Y JAY	-73.4	-165.9	PINE SISKIN	+100.0	-110.4
E JAY	-11.3	-51.2	EVENING GROSBEAK	-64.3	-48.9
CK-BILLED MAGPIE	+8.9	+254.0	HOUSE SPARROW	-16.6	+1009.4

THE 19TH-CENTURY TRADE IN SWAN SKINS AND QUILLS

C. STUART HOUSTON and MARY I. HOUSTON, 863 University Drive, Saskatoon, SK. S7N 0J8, and HENRY M. REEVES, 22250 Boulder Crest Lane, SE, Amity, OR. 97101

In an attempt to learn more about the pre-settlement numbers of swans in what are now the three prairie provinces, we consulted the records in the Hudson's Bay Archives (HBCA), Provincial Archives of Manitoba, in Winnipeg. Much has been written about the economics of the fur trade in what is now Canada, but little attention has been paid to one important side item of trade, swan skins and swan and goose quills. Few naturalists have realized what prodigious quantities of these two items were shipped from Hudson Bay back to Britain, as an additional item of trade along with valuable furs. Such overharvesting, superimposed on subsistence use, no doubt contributed to the Trumpeter Swan's decline in numbers and range, and to some decline in the Tundra Swan as well.

Samuel Hearne, who founded Cumberland House [Saskatchewan] in 1774, the first inland trading post of the Hudson's Bay Company (HBC), later reported that the Indians killed Trumpeter Swans "in such numbers that the down and quills might have been procured in considerable quantities at a trifling expence; but since the depopulation of the natives by the small-pox ... no advantage can be made of those articles, though of considerable value in England." Hearne also noted that one Trumpeter Swan egg was "a sufficient meal for a moderate man, without bread, or any other addition."¹⁰ One thirty-pound (14 kg)

swan, the heaviest bird in North America, provided a great deal of food for hungry people, especially welcome in spring after a winter diet of fish and pemmican. Hearne also reported that the swan skins "of which the Company have lately made an article of trade," became a trade item only near the end of the 18th century. After quoting from Hearne, Oliver Goldsmith in 1840 wrote: "They are much sought after ... for their flesh, their quill-feathers, and their down."⁹ Since *The Fur Trade in Canada: An Introduction to Canadian Economic History*¹² apparently does not mention and certainly fails to index swan skins, our search led elsewhere.

How common was the Trumpeter, east of the Rockies, in the 1600s? By extrapolating from the 1968 density of one swan per 20 km² in Alaska, and projecting this over an area of 2.6 million km² of the potential 4 million km² of prairie and boreal forest east of the Rocky Mountains, Lumsden made a credible estimate for 1600 A.D., really a "best guess" of 130,000 Trumpeter Swans.¹³ He felt that annual removal of 3000 to 5000 swans from this population for swan skins, possible only after the advent of firearms, "would not have been an excessive harvest." Such analysis of course presumes no drop in population over two or more centuries. There is good evidence that swans were common at Moose Factory in 1674, but the swan flight into James Bay had almost disappeared

by 1783-85.¹³ Whether or not Lumsden's early population estimates are credible, by the 1913 meeting of the American Ornithologists' Union there were predictions that "this magnificent bird was nearing extinction; and would soon disappear forever."³ Henry Coale could find, in a survey of all museums, only sixteen specimens collected between 1856 and 1909, five of them from Canada, preserved with authentic data. E.S. Cameron reported in a letter to Coale on 30 April 1914: "Twenty years ago Trumpeter Swans were common in [north-eastern] Montana, and used regularly to winter here, but are now on the verge of extinction."³ By 1935, only 69 Trumpeter Swans were known to exist in the wild, but unrecorded flocks also inhabited parts of Alaska and the Grande Prairie region of Alberta.¹⁶

The Trumpeter was not the only swan to be affected. The Tundra Swan disappeared as a breeding species from the general area of Hudson Bay for over 150 years, from before 1800 through 1969; they have since returned to breed in northern portions of Manitoba, Ontario and Quebec.¹³

Swan Skins

The number of swan skins listed for sale in London, 1799-1913, increased from a low of 168 in 1804 to 4305 in 1813. The different number of skins must have represented an increase in interest or value or both, rather than a change in the numbers or availability of swans of both species. The peak years were 1826, 1827, 1830, 1834, and 1837, with 5817, 5052, 5636, 7918 and 6600 swan skins, respectively, sold in those years, the five highest on record (HMR from HBCA, Figure 1). The last time numbers were over

1000 was in 1850, with 1038 skins. Average annual numbers for the decades ending in 1820, 1830, 1840, 1850, 1860, 1870, 1880 and 1890, respectively, were 2735, 3379, 3876, 1897, 981, 627, 190, and 120. The final recording was of 108 swan skins in 1891 (HMR).

These figures are somewhat at variance with and only loosely correspond to those obtained by Roderick Ross MacFarlane, from the Hudson's Bay fur catalogues "for sale in London." From 1853 to 1877 the HBC sold a total of 17,671, or an average of nearly 707 skins a year.¹⁵ The HBC catalogues listed seven good years (1853 to 1856, 1861, 1862, and 1867), with sales ranging in those years between 985 and 1,312, the maximum reached in 1854. There were seven poor years (1870 to 1877), with returns varying between 338 and the minimum of 122 in 1877.¹⁵

MacFarlane also provides helpful details concerning the major sources of these skins. From 1854 to 1884, inclusive, Athabasca District turned out 2,705 swan skins, nearly all of them from Fort Chipewyan. Mackenzie River District supplied 2,500 skins from 1863 to 1883. From 1862 to 1877 Fort Resolution, Great Slave Lake, contributed 798. For 1889 Athabasca traded but 33, as against 251 skins in 1853. In 1889 and 1890, Île-à-la-Crosse, headquarters of the English River District, sent out only two skins each year.¹⁵ Why were these large swans rarely seen by explorers and traders passing through? One presumes they retreated to large marshes and small lakes for breeding and moulting, off the path of those travelling by river canoe routes, and bypassed by those travelling overland.

HBC Swan skin annual totals

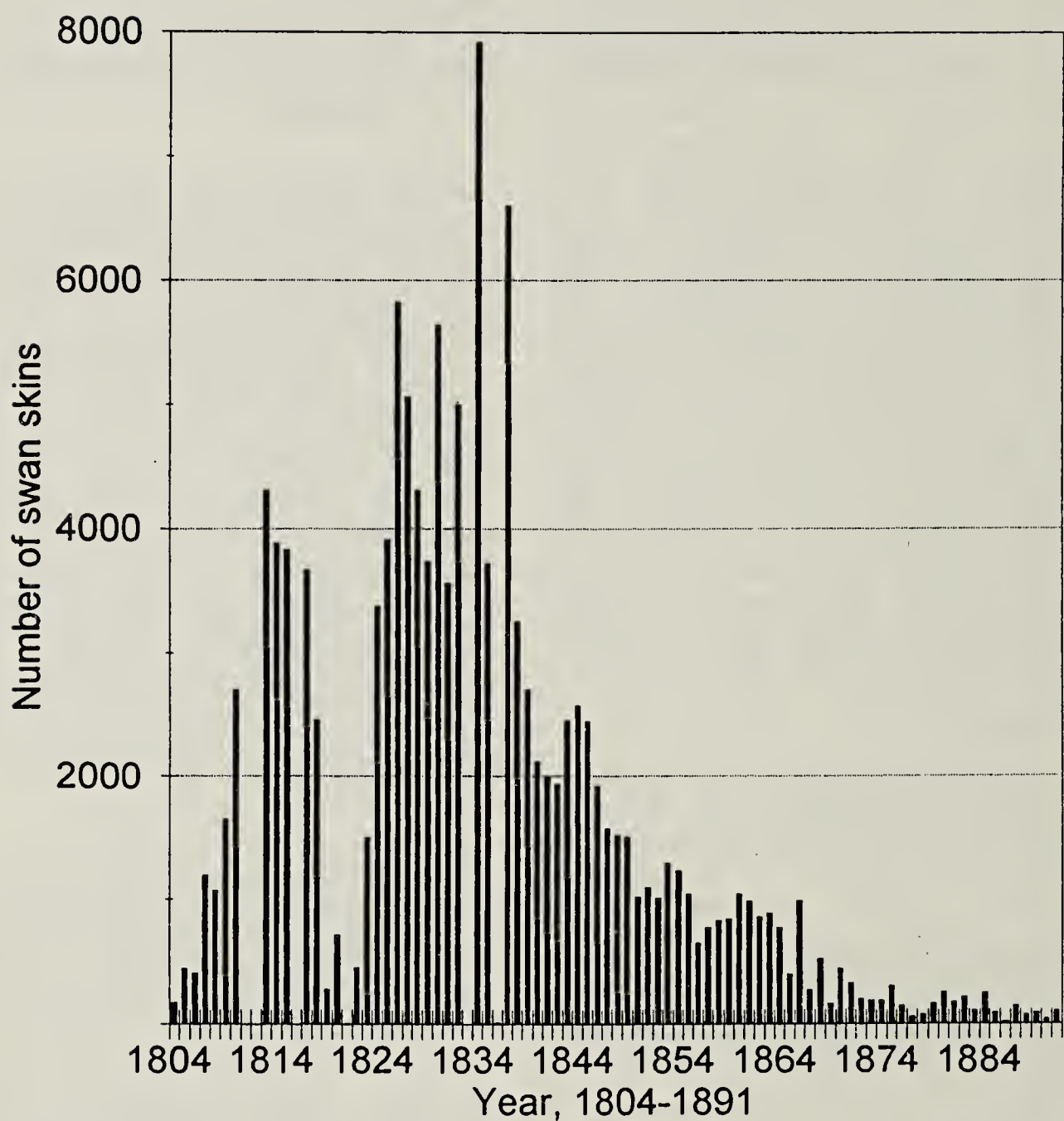


Figure 1. Swan skin annual totals, 1804-1891. Listed for sale by the Hudson's Bay Company, London. Compiled by H.M. Reeves from A.53/1, the *Fur Trade Importation Book*, 1719-1912. Hudson's Bay Company Archives, Provincial Archives of Manitoba (HBCA, PAM).

There is local corroboration from Fort White Earth #1, on the banks of the North Saskatchewan River south of the present town of Smoky Lake, Alberta. Alexander Henry the Younger, immediately after building this fort, reported that his men brought 70 swan skins from nearby Smoky Lake on 23 July 1810, and that eight days later he had 208 swan skins in stock.⁴ Cam Finlay reports that at Fort Edmonton, the only

source we know of that specifically identified quills as being from swans, 810 swan skins and 460 swan quills were collected in 1810-11, 1206 skins and 450 quills in 1811-12, and 1316 skins and 2740 quills in 1812-13.⁷ All other listings of quills may well have been a combined total of both goose and swan quills. Archaeological excavations have confirmed the presence of Trumpeter Swan bones from Fort White Earth.¹¹

Table 1. SWAN SKINS FROM HUDSON BAY LISTED FOR SALE, 1804-1819							
Year	Churchill	York Factory	Severn	Albany	Moose	Eastmain	Sum Six Posts
1804		168		37			205
1805		435					435
1806		396					396
1807	28	1133		27		4	1192
1808	9	997	1	60			1067
1809	6	1576		70			1652
1810		2706					2706
1811							0
1812							0
1813	219	4066		4		16	4305
1814		3853			16	15	3884
1815	348	3487					3835
1816							0
1817		3666			4		3670
1818		2462			1		2463
1819		273			6		279
Total	610	25218	1	198	27	35	26089
Compiled by H.M. Reeves at HBCA, PAM.							

Questions remain as to which species was killed for the swan skin trade, Trumpeter or Tundra (Whistling) or both? Where were they taken? How many were taken only in spring or fall migration? How many in summer, before the immatures could fly and during the adult flightless summer moult? What price did they fetch? What were these swan skins used for? Partial answers require melding of information from archaeological sources, fur trade archives and published historic records, but complete answers are no longer possible.

- 1) Both species were taken, the Tundra Swan only in migration.
- 2) A breakdown by individual trading posts on Hudson Bay, compiled by HMR, is available for 1804 through 1819 (Table 1). Almost 97% (25,218 of 26,089 swan skins) came through York Factory, the direct link with the plains and parkland areas of what are now the prairie provinces, far south of the nesting area of the Tundra (Whistling) Swan.

3) For the subsequent two decades, 1821 through 1841, numbers of swan skins taken in each trading district have been transcribed from HBCA B239/h/1 by MIH (Table 2). The first four areas, in descending order of importance, were the Saskatchewan River (Carlton and Edmonton, which traded with Indians on the plains), Churchill River (then called English River), Athabasca, and the Swan River. Each of these localities was south of the nesting area of the Tundra Swan. With the exception of 1804, these figures correspond exactly with HMR's numbers for sale in London for those years. These inland localities delivered their furs to York Factory, where in the previous two decades these skins would have been listed as from York Factory.

4) A scattering of early historical nest records confirm that Trumpeter Swans bred on the northern Great Plains from Iowa up through North Dakota into Manitoba and Alberta, north into the parklands and

Table 2. DISTRICT FUR RETURNS - SWAN SKINS, 1821-1842

Fur Trade District	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	Total
Athabasca		260			1404	1407	1413	738	2133	71	1286	1202	485	216	340	776	745	736	716	562	560	15050
English (Churchill) River	52	428	1647	1057	890	1289	800	1128	1271	778	975	1108	827	534	639	797	783	502	456	384	310	16655
Cumberland House	24	35	112	222	264	390	232	20	44	46	51	176	196	178	131	71	57	31	42	37	23	2382
Saskatchewan	256	370	408	533	991	1200	1215	1445	1603	2366	2045	2002	1616	1447	1087	904	925	628	433	536	481	22491
Swan River	34	208	189	624	900	375	447	192	139		154	507	556	537	488	408	430	385	166	103	118	6960
Lower Red River	17	20	5	60	209	45		8	2	19	24	64	66	246	225	376	199	147	200	171	209	2312
Upper Red River (Minnesota)	10	48	74					8	3	27	26		3									199
Winnipeg (Lake)		8	6	34	27	20	12	25	16	6	18											172
Lac la Pluie	37						1															38
Norway House		2	2	4	15		2	4		1	1	20	20	11	13	8	13	41	28	7	18	210
Island Lake		2		7	24	10	1	4	7	6	14	11	11	5	2	4	1	1	7	5	1	123
Severn	2		3																			5
Nelson River		63	123	78	120	18	6			12	13	12	6	16	14	18						499
Churchill		18	18	51	110	90	62	96	362	168	275	327	154		159		68	182	42	154	108	2444
York Factory			73					830		422					48	158	258					1789
Western Caledonia (nil)																						
Totals (each of 21 years)	432	1462	2660	2670	4954	4844	4191	4498	5580	3922	4882	5429	3940	3190	3146	3520	3479	2653	2090	1959	1828	71329

Compiled by M.I. Houston from B239/b/1, HBCA, PAM. Italics = four highest totals

southern mixed forest.¹ Lumsden suggests that this larger species needed an ice-free period of at least 140 days, and preferably 154 days, to complete its long breeding cycle, coinciding nicely with what we know about the northern edge of their presumed breeding, south of that of the smaller Tundra Swan.¹³

5) The most authoritative comment is by Dr. John Richardson, who collected birds at Cumberland House and Carlton House in Saskatchewan in the 1820s; he reported that "It is to the Trumpeter that the bulk of the Swan-skins imported by the Hudson's Bay Company belong."¹⁸ As late as 1859, Blakiston concurred that the Trumpeter was still the commoner species at Carlton.²

6) Harry Duckworth (pers. comm.) has recorded purchases in London: in January 1808, Joseph Binter purchased £482 worth of swan skins; George Smith, £227; Peter Raymond Poland, £163; and Schnerot (?), £85. In April 1810, Joseph Binter purchased £195 and Mr. Riechard, £100. If we make a wild assumption that these men purchased all of the 1192 and 1652 swan skins sold in each of those years for the European market, then each swan skin may have been worth nearly £1 in the first instance and one-fifth this amount two years later. If these businessmen purchased only half the swan skins, the amount per skin would double, and if only one-fifth, then the unit value would increase by five times.

7) Wilmore tells us that in Europe swan skins were used in the manufacture of powder puffs for women.²¹ One wonders, with the large numbers involved, whether the skins might also have been used for coat linings? Harold Burgess, a

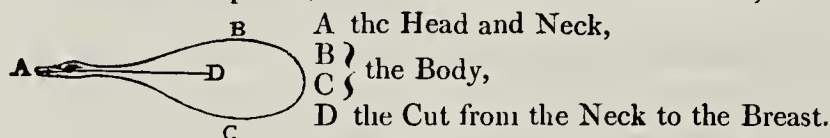
researcher into Trumpeter Swans, has read in historical fiction that swan skins were also used for making vests, ceremonial robes and for ornaments such as epaulets on uniforms of high-ranking officials. Andrew Dawney⁵ tells us swan skins were still valued at five pence (25 cents) a pelt in 1899. The beautiful snow white down of the Bewick's Swan, when dressed by a furrier, made women's neck pieces (boas) "of unrivalled beauty." Warwick, Pitz and Wyckoff (1965) illustrate a loose jacket, brought over from Holland by Dutch settlers in New York, "trimmed with fur or swansdown around the neck, down the front, and around the bottom."²⁰ In Russia the tough skin and warm soft pelt was used for wallets, jackets and caps. Barbara Nichols¹⁷ reports that swan skins were used for powder puffs, quilts, pillows and mattresses. Jack London, in his short story, "The night-born" in *Jack London Short Stories*, mentioned a robe of swan-skins" (Karen Lunsford, pers. comm.). In *Little House on the Prairie*, Pa Ingalls shot a swan and Ma Ingalls made a small swan cape for the youngest girl (Brian Burchett, pers. comm.).

The demand for swan skins was no respecter of species. Earlier in this century, Frank M. Chapman found "hundreds of thousands" of Black-necked Swan skins in an Argentina warehouse awaiting shipment to be made into women's powder puffs.⁵

Judith Hudson Beattie has allowed us to reproduce the official Hudson's Bay Company directive that told traders how to prepare swan skins of the highest value (Figure 2). This printed "broadside" dated from circa 1817, when R. Causton and Son had their office at 21 Finch Lane (Harry Duckworth, pers. comm.). Nearly a

DIRECTIONS FOR CURING AND PRESERVING Swan Skins.

AS Swans are generally shot, let the Feathers be pulled out while the Bird is hot, with the greatest care not to injure the Fine Down underneath; the Blood that may be upon the Skin may be washed off with Soap and Water, and well dried afterwards; the Bird will be skinned much easier after the Feathers are pulled, and must be done in this manner,—



The Back must not be cut, and it is not necessary, as the Bird may be skinned by drawing it through the Part cut from the Head to the Breast; when dry, it may be turned the Pelt or Skin outside, which will protect the Down from being injured by Grease, &c. and will come safe in Packages any distance.

N.B. The Swan Feathers should not be mixed with those of the Goose.

Printed by R. Causton & Son, 21, Finch-Lane, Cornhill, London.

Figure 2. Directions for curing and preserving swan skins [ca 1817]. HBCA A.63/22 fo.3 (N13516). Courtesy Judith Hudson Beattie and HBCA, PAM.

half-century later, the Governor and Committee gave very similar instructions to Ferdinand Jacobs on 12 May, saying “We are informed that the skin of the Wild Swan may probably turn out of some utility in our trade ...”(HBCA A.6/11, fo 170d).

Swan and Goose Quills

The flight feathers of all birds were long known as quill-feathers. Some clues to the increasing interest in quills as a commercial item derive from entries in the 1942 edition of *Encyclopedia Britannica*. Under Feather: “The earliest period at which the use of quill feathers for writing is recorded is the 6th century ... Only the five outer wing feathers of the goose are useful for writing, and of these the second and third are the best, while left-wing quills are more esteemed than those of the right as they curve outward and away from the writer using them. ... Swan quills indeed are better than those from the goose.”¹⁴ Under Pen:

“In 1809 Joseph Bramah devised and patented a machine for cutting up the quill into separate nibs by dividing the barrel into three or even four parts, and cutting these transversely into two, three, four and some into five lengths.”⁶ Under Bramah: “Joseph Bramah, 1748-1814, was an English engineer and inventor, who invented the hydraulic press, paper-making machinery, a numerical machine for printing bank-notes, and the Bramah lock.”

Until improved nibs were invented, quills required continual sharpening. The average clerk would use more than one new quill pen per day. “Bed-feathers” were first sold by the HBC in the London market in November 1736 and “goose quills” were first offered in December 1744 and November 1745 (Harry Duckworth, pers. comm.). Swan quills were in greater demand and sold (in bundles of 25 or 100) at the highest price. Swan and goose quills from Hudson

HBC Quill Annual Totals

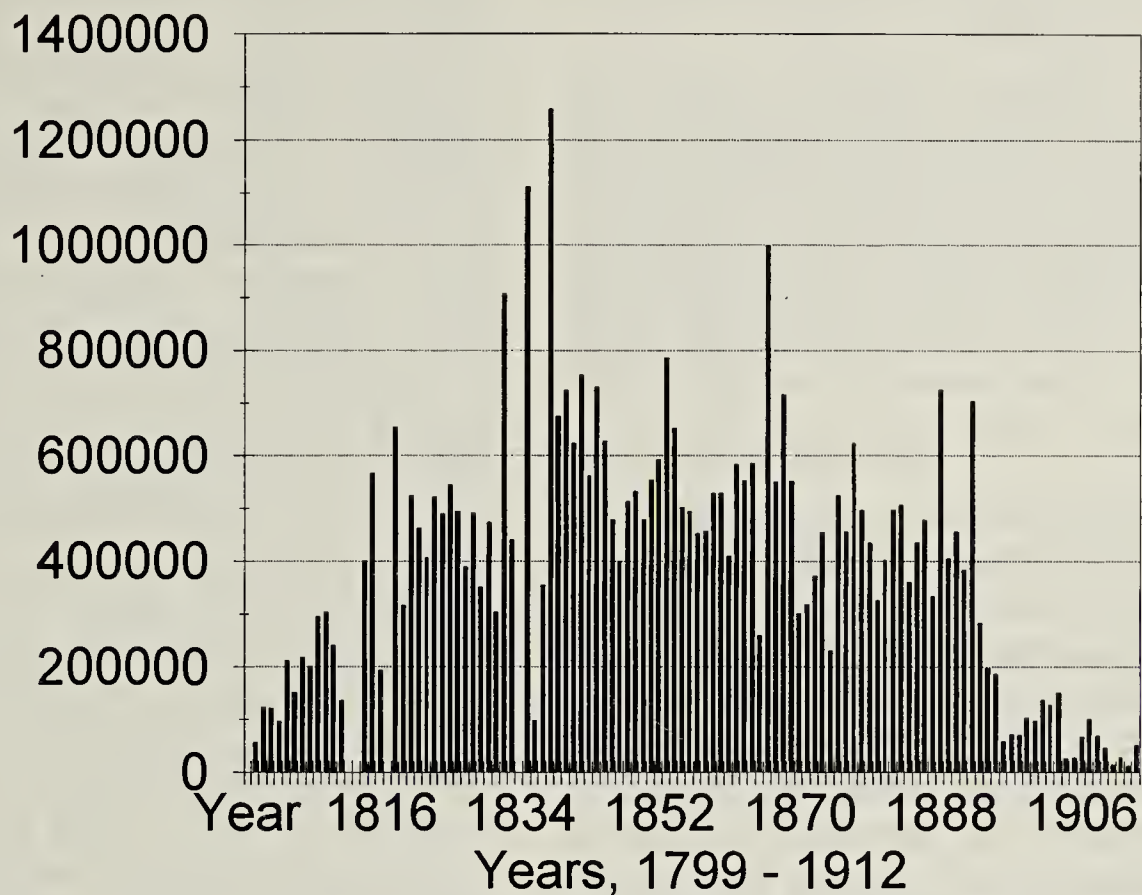


Figure 3. Goose and swan quill annual totals, 1799-1911. Listed for sale by the Hudson's Bay Company, London. Compiled by H.M. Reeves at HBCA, PAM

Bay sold in increasing numbers, from 58,000 in 1799 to 566,632 (think of the tedium involved in counting them!) in 1814 and 655,030 in 1817 (HMR from HBCA, Figure 3). Sales peaked at 1,112,000 in 1834 (the year that a grand total of 18,732,000 quills were sold in London⁷) and 1,259,000 in 1837. At a maximum of ten useable quills per bird, 1837 saw the sacrifice of over 100,000 swans and geese.

There is only a modest correlation between the number of swan skins and the number of quills sold in a given year. The climate was colder then than now, and sailing ships each year ran the gauntlet of icebergs in Hudson Strait. The four years when no skins and no quills were sold in London were years

when the annual ship or ships were unable to return to England, and each gap was followed by an abnormally high total. The first gap of two years may be explained because the *Edward and Ann*, carrying the first 105 Selkirk settlers bound for Red River, was too pressed to make the customary stop at Churchill. The 1811 voyage, taking 61 days, set an all-time record. In 1812, the problems of war with the United States may have been reflected as far north as Hudson Bay. In 1816 the *Prince of Wales* was caught in ice and did not return to England and in 1833 the *Prince Rupert V* suffered a similar fate. Extremely low numbers of skins and low-average numbers of quills in 1836 perhaps resulted from two of the three ships that year having to winter in the bay, while the *Prince*

Rupert V, after being beset in ice from 23 August to 19 September, returned without fully unloading its inbound cargo.

In general, sales of quills and swan skins both peaked in the 1830s, but quantities of the prime "Hudson Bay quills" presumably came from geese. Quill numbers did not fall off as quickly as did swan skins, and remained relatively high through 1891.

Finlay's informative book, *The History of the Quill Pen*,⁸ shows that at one time, crow quills, for architectural drawing, fetched as much as 9 shillings per 100; turkey quills, for law writing, were 7 shillings; domestic goose quills, 15 shillings; "Hudson's Bay quills" and swan quills each went as high as 63 shillings per 100. In England, huge flocks of geese were farmed mainly for their quills; in 1812 nine million geese were plucked for the domestic market. The quills of the wild geese from North America were even more highly regarded, since "the best quills came from the coldest countries." Swan quills were even better, "a single swan outlasting as many as fifty made from goose quills." The five largest feathers from each wing were used. The first primary was called a pinion; the second and third were labelled "seconds" and the fourth and fifth, "thirds."⁸ There was a tradition that swans' quill pens were left full feather.⁸

Quills were obviously big business; 27 quill and pen manufacturers and dealers were listed in *Pigot's London Directory* (1822), while Newcastle-upon-Tyne had three. Though metal pens became available in the 1820s, most writers and almost all lawyers preferred the quill, as it "enables an expert Scribe to both text and en-

gross in a better style, and to cut the letters more clearly."⁸ The last large year for quills from Hudson Bay was 1865, when the total was just one thousand short of the million mark. Numbers dropped to 59,000 in 1895, reflecting increasing competition from the development of metal pen nibs. In the last two years on record, 1911 and 1912, 12,000 and 52,000 quills, respectively were sold (Figure 3). Manufacture of metal pen nibs became common in the United States in the 1860s, but it is apparent that not all writers switched for another half-century. As late as 1894, one firm supplied the India Office with more than two million quill pens, and in 1908 swan pens were sold with gold- and silver-plated tips. The last quill company closed its offices in London in 1954, when computer "punched card systems" were now in evidence!⁸

Swans as Food

In medieval England ownership of swans was a mark of social standing. As a food item, especially as the set-piece for banquets, a swan was extremely expensive, selling in London in 1274 for three shillings (36 pence), compared to five pence for a goose and four pence for a pheasant. The punishment for stealing swan eggs was imprisonment for a year and a day. For stealing a swan, the thief had to pour wheat over the suspended bird, hung by its beak, until the tip of the beak was covered; the wheat was then paid to the swan owner.⁵

Trumpeter Swan Populations in North America

Bones from early historic sites suggest that the Trumpeter Swan suffered from more drastic declines than other large birds such as the Sandhill and Whooping Cranes. All

these species fared poorly with settlement, and were driven out as land was ploughed and marshes drained. Trumpeters began their decline at least a century earlier than the cranes. Originally breeding from at least Kentucky and from Chesapeake Bay north to the maritime provinces and wintering south to northern Florida, Trumpeters quickly disappeared from eastern North America as humans advanced inland.¹⁹ Undoubtedly subsistence taking of its eggs and meat as prime food items antedated recorded history, but later demand for its skins and quills added to its demise. As Banko summarized in his classic monograph in 1960, "The effects of such exploitation on the far-flung breeding populations of this species for more than 125 years must have been devastating and largely responsible for its extermination over vast regions, particularly in the heart of its Canadian breeding range."¹

We strongly suspect that the pre-1900 falling-off in numbers of Canadian swan skins sold each decade in London reflected over-harvesting of these large birds, aggravated by collecting of both the swans and eggs in season for food, especially after bison numbers fell drastically in mid-century.

Extinction of the Trumpeter Swan was narrowly averted at the turn of this century. With protection, numbers have increased in a gratifying manner, such that the Pacific Coast population in Alaska increased to 9500 individuals by 1991, while the Rocky Mountain population (including northern Alberta) increased eleven-fold to 2200 individuals. The restored interior population had 629 free-flying birds by 1993.¹⁶ Trumpeter Swan reintroduction programs are gaining speed wherever they have been attempted; in southern

Ontario they began in 1982. On 1 September 1995 there were 82 Trumpeters flying free and one year later, 123 (Harry Lumsden, pers. comm.). Trumpeter Swan's recovery has been sufficiently successful that it has been de-listed from the federal endangered species list. However, we should learn from the history of its exploitation there are better methods to manage our wildlife resources.

Acknowledgements

We thank Judith Hudson Beattie, keeper of the Hudson's Bay Archives, Provincial Archives of Manitoba, for continued help and support, and for providing the print of the broadside giving directions for preparation of swan skins. Harold Burgess found two sources of information concerning the use of swan skins. Ruth E. Shea and Rod C. Drewein provided constructive criticism of an earlier draft. Harry Duckworth provided dates for operation of the R. Causton printing firm in London, payments made for swan skins in London, and, on our behalf, posed a question to members of the 18th Century Interdisciplinary Discussion Group on e-mail, which brought helpful responses from Karen Lunsford at the University of Chicago and Brian Burchett at the University of North Dakota. Cam Finlay provided data on swan skins and quills from Fort Edmonton.

1. BANKO, WINSTON. 1960. The Trumpeter Swan. North American Fauna #63. 214 pp.
2. BLAKISTON, THOMAS. 1863. On birds collected and observed in the interior of British North America [part 4]. *Ibis* 5:121-155.
3. COALE, H.K. 1915. The present status of the Trumpeter Swan, *Olor buccinator*. *Auk* 32:82-90.
4. COUES, E. 1897. New light on the

- earlier history of the Greater Northwest: the manuscript journals of Alexander Henry and David Thompson. Francis P. Harper, New York. Vol. 2, pp. 615-616.
5. DAWNEY, ANDREW. 1972. Exploitation, pp. 167-180 in P. Scott, ed., The swans. Houghton Mifflin, Boston.
 6. ENCYCLOPEDIA BRITANNICA. 1942. Bramah, Joseph, 4:25; Pen, 17:459-460.
 7. FINLAY, CAM. 1997. Animal populations and habitat changes in the contact period on the North Saskatchewan. Proceedings of the Rupert's Land Colloquium, Edmonton, 23-25 May 1994, ed. I.M. MacLaren [in press].
 8. FINLAY, MICHAEL. 1990. Western writing implements in the age of the quill pen. Plains Books, Wetheral, Carlisle, Cumbria.
 9. GOLDSMITH, OLIVER. 1840. A history of birds. Vol. 3, pp. 1-439, in A history of the earth and animated nature. Archibald Fullarton, Glasgow.
 10. HEARNE, SAMUEL. 1795. A journey from Prince of Wales Fort, in Hudson's Bay, to the Northern Ocean, in 1769, 1770, 1771, and 1772. T. Cadell, London.
 11. HURLBURT, I. 1977. Faunal remains from Fort White Earth, N.W. Co. 1810-1813. Prov. Mus. Alberta Occas. Paper #1 (pp. 55-60, 107).
 12. INNIS, HAROLD. 1956. The fur trade in Canada: an introduction to economic history. University of Toronto Press, Toronto. 463 pp.
 13. LUMSDEN, H.G. 1984. The pre-settlement breeding distribution of Trumpeter, *Cygnus buccinator*, and Tundra Swans, *C. columbianus*, in eastern Canada. *Can. Field-Nat.* 98:415-424.
 14. ENCYCLOPEDIA BRITANNICA. 1942. Pycraft, W.P. Feather, 9:128-131.
 15. MACFARLANE, RODERICK ROSS. 1905. Notes on mammals collected and observed in the northern Mackenzie River district... . *Proc. U.S. Nat. Museum* 28:673-764.
 16. MITCHELL, CARL D. 1994. Trumpeter Swan (*Cygnus buccinator*) in The birds of North America, No. 105 (A. Poole and F. Gill, eds.). Acad. Nat. Sci., Philadelphia, and AOU, Washington, DC.
 17. NICHOLS, B. 1990. Trumpeter. *Michigan Natural Resources* Oct. 1990: 12-17.
 18. RICHARDSON, JOHN, and WILLIAM SWAINSON. 1831 [=1832]. *Fauna Boreali-Americana*, Vol. 2, The birds. John Murray, London. 501 pp.
 19. ROGERS, PHILIP M., and DON A. HAMMER. 1981. Ancestral breeding and wintering ranges of the Trumpeter Swan (*Cygnus buccinator*) in the eastern United States. Tennessee Valley Authority, Knoxville, TN.
 20. WARWICK, E., H.C. PITZ, and A. WYCKOFF. 1965. Early American dress: the colonial and revolutionary periods. Benjamin Blom, New York.
 21. WILMORE, S.B. 1974. Swans of the world. Taplinger Publishing, New York, p. 91.



Bird Names

Anna, Duchess of Rivoli (1806-1896), wife of Prince Victor Massena and daughter-in-law to one of Napoleon's marshals, Andre Massena, Duc de Rivoli — Anna's Hummingbird and Rivoli's Hummingbird for Victor.

SIGNIFICANT OBSERVATIONS OF TRUMPETER SWANS IN SASKATCHEWAN

HAROLD H. BURGESS, 808 South Kansas Ave., Weslaco, TX 78597

Since 1984, Ruth Burgess and I have recorded observations of Trumpeter Swans (*Cygnus buccinator*) chronologically, by states and provinces. The threatened nature of the Cypress Hills flock and the resettling of the Porcupine Hill area after an absence of a century or more, made Saskatchewan listings more important. It is gratifying that this once-threatened species continues to increase in numbers and to spread. H. Greenwood and A. Young's 1987 "Study on the Restoration of Trumpeter Swan Populations in Saskatchewan"⁸ challenged us to carefully research their interpretation of history and ornithology, and extend the study of historic Trumpeter Swan occurrences in Saskatchewan.

Early explorers and Hudson's Bay Company post managers differentiated between the two swan species. The larger species, the Trumpeter Swan, arrived earlier in the spring and stayed later in the autumn than the small species, the Whistling or Tundra Swan. Early spring-late autumn criteria allowed Houston and Street¹¹ to separate Trumpeter from Whistling Swan data in *The Birds of the Saskatchewan River*.

The Trumpeter Swan was first described and given its scientific name, *Olor buccinator*, by Dr. John Richardson in 1832. The type specimen had been "killed at Hudson's Bay, and [is] now in the H.B. Museum." This was "the most common swan in the interior of the fur-coun-

tries. ... its [spring] migrations generally precedes the Geese a few days." The Trumpeter provided "the bulk of the swan-skins imported by the Hudson's Bay Company."³¹

The first swans to arrive in spring at Cumberland House, were reported by Indians or HBC employees to the post manager or scribe whose name is given in parentheses¹¹: on 24 March 1774 (Hearne), 31 March 1777 (Cocking), 16 April 1778, 31 March 1779, 11 April 1780, 3 April 1781 (Tomison), 12 April 1782 (Hudson), 10 April 1820 (Lieut. Robert Hood), 20 April, 1840 (Lewis). Although then in a period of lower average temperatures, the swans departed late in the fall, e.g. 13-16 November 1781 (Hudson).¹¹

At Lower Hudson House, south of present Shellbrook, swans returned on 6 April 1781 (Longmoor) and 15 April 1782 (Walker).¹¹ Between Bolsover House, near present Meadow Lake, and Lac la Biche, Alberta, 8-21 September 1791 Peter Fidler's men¹⁴ "existed on an insufficient diet of duck, geese, and swans."

In 1858, Thomas Blakiston,¹¹ with the Palliser expedition on 30 March 1858, preserved the skin and windpipe of a Trumpeter Swan shot a quarter mile from Fort Carlton. "It measured 60 1/2" in length, 26 1/2" in wing, 8' 3" in extent, bill [culmen] 4 5/8" It was a male and weighed 23 pounds. Dr. Richardson considers this the more common of the two



Immature Tundra Swan

Ken Lumbis

Swans inhabiting the interior and the earlier visitor, with which my observations agree." In mid-September 1862, north of the Qu'Appelle Valley, between Fort Ellice and Touchwood Hills, Milton and Cheadle noted "occasionally the appearance of ... a flock of white swans gave fresh zest to the sport."²⁰ These swans were not migrants; cygnets and successful pens (after moult) did not fly until at least 20 September, and migrated much later.

Nero²² reviewed early swan sightings in far northern Saskatchewan. Philip Turnor, on 22 August 1791, pitched his tent over the one level place on the island, "an old Swans nest which made us a comfortable bed," on a rocky island on the north shore of Lake Athabasca a few miles east of Fond du Lac. Five days later, near Spring Bay, Turnor saw several swans. David Thompson killed two swans near the south end of Reindeer Lake in mid-July 1796.²² For the period 1785 to 1797, Thompson

wrote: "There are two Species of Swans. They lay from seven to nine eggs. When shot, twelve eggs have been counted in them, but nine is the greatest number I have found in a nest, and also of the number they rear."³⁴ Nero also reported a modern sighting, from midsummer 1952; A. Stinson reported a bugling swan pair with three cygnets west of Stony Rapids, Saskatchewan.²²

In neighbouring Manitoba, between 1851 and 1858, two swan eggs from a nest on the banks of a lake near Norway House were brought to George Barnston.³ At Shoal Lake, west of Erinview, Manitoba, Frank Ward, Senior, observed swans with cygnets in 1893-1894.³³

In Saskatchewan, as with the other nesting areas on the Great Plains, this large bird was extirpated locally by pre-settlement travellers, often before the first settlers arrived. John Macoun saw none in his trips across the prairies in 1872 and 1875, and

reported that both species of swans "are only seen in migration."¹⁸ Meagre documentation of breeding persisted into the 1890s, involving only two nests within what is now Saskatchewan and one twenty miles west in what is now Alberta, would be inadequate were it not for breeding records in contiguous areas, Alberta, Montana, the Dakotas, Minnesota and Iowa.¹ Oliver Davie gave the following second-hand report in 1889, "On the islands of the fresh water lakes and ponds bordering the north branch of the Saskatchewan River, in British America, a few pairs of the Trumpeter Swan are to be seen throughout the summer."⁷ On 7 April 1891 a collector took two sets of five and two eggs from Buffalo Lake.¹⁹ Evidence that it was not the Buffalo Lake near Stettler, Alberta, but Buffalo Pound Lake, north of Moose Jaw, Saskatchewan, is based on two pieces of information: the same date for Buffalo Lake is given in Raine, who tells us that the eggs were collected by Raine's guide, Mr. Spaulding, who at the time managed a ranch at Rush Lake, Saskatchewan.¹² There is also oral evidence from Jim Sanderson, a government scout,¹⁹ who "has lived all his life in Assiniboia and Saskatchewan ... wild swans used to breed on some of the lakes in Northern Assiniboia and Saskatchewan before the Canadian Pacific Railway was built. The last nest he found was during the spring of 1885 ... at Sounding Lake in Assiniboia, and contained four fresh eggs." [Sounding Lake, 52° 08' North and 110° 30' West, was initially within the postal district of Saskatchewan, immediately north of the postal district of Assiniboia, but the 1905 boundary between the new provinces of Alberta and Saskatchewan was moved east, so that Sounding Lake is now within Alberta, 20 miles west of Saskatchewan.]

A typed note by Fred Bradshaw in the Saskatchewan Museum of Natural History, dated 23 May 1930, found by Dale Hjertaas, told of a swan nest found close to the village of Richard, Saskatchewan, by William V. Geekie. In April 1911 Geekie had found a nest with one very large egg in a patch of short snowberry bushes, 30 m from the gravelly shore of the marsh, and presumed it belonged to the resident pair of swans. A month earlier he had shot one swan in the same slough; it weighed 28 pounds dressed, clearly a Trumpeter Swan.

In the early part of this century there were fall migration sightings of Trumpeter Swans by a reputable observer, George Lang. Eight Trumpeters at Deep Lake, south of Indian Head, were identified by their calls on 10 November 1921, and a small group passed down the Qu'Appelle Valley, north of Indian Head, on 26 October 1922.²¹ After a gap of some 60 years, fall sightings are again being reported, such as one seen during the Christmas Bird Count at Squaw Rapids on 24 December 1985,¹³ and one at Echo Valley Provincial Park for a full month beginning 1 December 1991.¹⁵

The first report of breeding on the Alberta side of the Cypress Hills came in 1948, from Twin Lakes at the source of the Battle Creek, three miles west of the Saskatchewan border. The pair there had four young in 1949 and four young in 1950.¹⁷

First information concerning resident Trumpeter Swans at Cypress Lake, just south of the Cypress Hills, Saskatchewan, came in 1914, when a pair was observed by R.D. Symons.³² In the Cypress Hills, in 1953, a pair raised a single young on Adams Lake, and another pair was

seen at Bottley Lake, a local widening of Adams Creek, 1.5 miles south of Adams Lake;² in 1957, there were 3 adults and 7 young at Bottley Lake;²⁹ in 1960, 2 adults and 3 cygnets were present at Adams Lake and another pair, probably with young, on Belanger Creek.¹⁶ From 1962 through 1965, only one Trumpeter pair was recorded, but by 1966, two pairs were again present.²³ After four years without reports, a concerted air and group search was made in 1971, finding three breeding pairs within the Cypress Hills Provincial Park and Forest Reserve on two lakes and a beaver pond, with 2, 2 and 4 cygnets, and one non-breeding adult.²³ In 1972, three pairs had clutches of 6, 7 and 5 eggs, and raised 2, 2, and 4 cygnets.²⁷ In 1973, two pairs had 6 and 5 eggs on one lake and a beaver pond and raised 3 cygnets each.²⁷ In 1974 there were 4 adults and 6 cygnets;²⁶ in 1975, 4 adults and 1 cygnet; in 1976, 6 adults and 4 cygnets; in 1977, 8 adults and 3 cygnets; in 1979, 4 adults and 6 cygnets.²⁶ In 1980, a pair was observed on eggs on 27 May; that year an adult from another pair collided with a power line and its mate disappeared.²⁶ From 1983 through 1991, there was only a single pair present, on Coulee Lake; their nest was abandoned in 1986 (the year that I personally observed three non-breeders farther northeast at Andrew Lake near Piapot), and no nest attempt was made in 1988; 3 cygnets were raised in both 1983 and 1984, 2 cygnets each in 1985, 1987 and 1990 and only one cygnet each in 1989 and 1991. From 1992 through 1995 a single adult was present without a mate.⁶ Neck bands placed by the Canadian Wildlife Service have shown that these birds winter in the overcrowded Yellowstone Park region in Wyoming and adjacent Idaho and Montana.³⁰

There have also been summer swan sightings on the eastern boundaries of Saskatchewan. In 1982 swans summered on Swan Lake east of Birch River, Manitoba, approximately 30 miles east of Saskatchewan (Brian Hart, pers. comm. 1982). In July 1987 there were summering swans on Cul de Sac Lake, 53°37' North, 101°47' West and Murphy Lake, 53°42' North, 101°47' West, just west of the Manitoba boundary.⁸ To further confuse the issue, Tundra Swans may on rare occasions summer far south of their normal breeding range. From 1969 through 1981 one productive swan pair at Midnight Lake,²⁸ thought from the southern location to be Trumpeters, was determined from egg size and from measurements of a moulting adult, to be Tundra Swans. Two at Tobin Lake, captured during moult on 28 August 1972, also proved to be Tundra Swans.²⁸

The exciting news of Trumpeter Swans returning to nest in lakes of the High Tor Hills near Greenwater Lake, Saskatchewan, has been documented by Hooper.^{9,10} Swans observed in summer at Bjork Lake in the mid-1970s and at Marean Lake in 1986 and 1987 were identified retrospectively as probable Trumpeters.^{9,10} In 1989 there were definitive identifications of a pair at Mystery Lake on 28 May, a pair on Marean Lake 27-29 June,^{9,10} and a pair with four young at Raven Lake in July.¹⁰ In 1990 there was a pair with three young near Pickel Lake in July, perhaps the same pair, and three cygnets that were photographed at Greenwater Lake on 8 May.¹⁰ On 22 July 1991, Shandruk, Beaulieu and Hooper visited the deserted nest in Greenwater Provincial Park, in shallow cattail habitat 65 m from shore; an egg contained a fully developed embryo that had failed to hatch. On

23 July, Len Shandruk captured both moulting adults in a marsh 2 km from the nest. Yellow neck collars were applied; AC30 on the male and AC31 on the female. These were sighted later that year at Lacreek National Wildlife Refuge, near Martin in southwestern South Dakota on 29-31 October.³⁰ In 1992 and 1993 male 30AC returned to Greenwater without his mate and in 1993 was with another adult.⁵

In the Porcupine Provincial Forest, from 20 km east of Greenwater Lake almost to the Manitoba boundary, there were 12 adults and 7 cygnets in 1992,⁴ and an aerial survey on 23 August 1993 found 17 adults and 4 cygnets.⁵ That year in August two swans were sighted 40 miles west of Greenwater Park and in September there were four swans east of Carrot River, 60 miles north of Greenwater Provincial Park.⁵

In 1994 there was one pair in Greenwater Park and 20 adults and 10 cygnets in the Porcupine Provincial Forest where in July seven adult Trumpeters were marked with red collars at six sites. All seven, together with yellow-collared 30AC from 1991 (it also was sighted in the two intervening years), appeared at Lacreek Refuge in late October.⁶

In the summer of 1995, there were 20 adults and 5 cygnets in the Porcupine area, and one pair north-east of Fort a la Corne.⁶ During the winter of 1995-96, again one yellow-collared and six red-collared swans staged and/or wintered at Lacreek Refuge (Wayne Runge, pers. comm., 16 March 1996).

We do not know the origin of 12 Trumpeters seen in mid-September 1993 in Prince Albert National Park.⁵

It is disappointing that the "natural" population in the Cypress Hills is no longer productive. However, it is encouraging that the Greenwater-Porcupine flock is increasing. Although this new flock winters in South Dakota, these birds may or may not, in whole or in part, be related to the reintroductions of Trumpeter Swans there.

Acknowledgements

I wish to thank Dale Hjertaas and Rhys Beaulieu, Saskatchewan Environment and Resource Management, for their help: Dale for introducing Saskatchewan to us as a Trumpeter Swan study area and for reviewing our reports; Rhys for recent Saskatchewan Trumpeter Swan data. I thank Dan Nieman, Canadian Wildlife Service, for making his Cypress Hills Trumpeter data available. My wife, Ruth Longstaff Burgess, typed the initial drafts and our daughter, Mary Bote, keyboarded this material on her word processor. We thank the Weslaco (Texas) Public Library and particularly Susie Lazono for her persistence in computer searching for and obtaining otherwise inaccessible references. I also wish to thank C. Stuart Houston for his considerable help in the preparation of this article, for adding details to the historical review and for pinpointing obscure geographic locations.

1. BANKO, W. 1960. The Trumpeter Swan. Pub. #63, N. Am. Fauna, U.S. Fish and Wildlife Service, pp. 8-25.
2. BARD, F. 1953. The Trumpeter Swan. *Blue Jay* 11(4):26-27.
3. BARNSTON, G. 1860. Recollections of the swans and geese of Hudson's Bay. *Ibis* 2:253-259.
4. BEAULIEU, R. 1992. Saskatchewan Trumpeter Swans. *Trumpeter Swan Society Newsletter* 21(2):7.
5. ——. 1994. Saskatchewan Trumpeter population increase. *Trumpeter Swan Society Newsletter* 23(1):13.

6. —. 1996. Recent history of Trumpeter Swans in Saskatchewan. Unpubl. report SERM Wildlife Branch.
7. DAVIE, O. 1889. Nests and eggs of North American birds. Hann and Adair, Columbus, p. 85.
8. GREENWOOD, H., and A. YOUNG. 1987. Phase I of a study on the restoration of the Trumpeter Swan populations in Saskatchewan, historical range, exploitation, and populations trends 1743-1987. Eikos Ecological Research Associates, Ltd. Prince Albert, Saskatchewan.
9. HOOPER, D.F. 1991. Trumpeter Swans in eastern Saskatchewan. *Blue Jay* 49:72-74.
10. —. 1992. Birds of east-central Saskatchewan. Special publication #18, Saskatchewan Natural History Society, Regina, pp. 41-43.
11. HOUSTON, C.S., and M.G. STREET. 1959. The birds of the Saskatchewan River, Carlton to Cumberland. Special Publication #2, Saskatchewan Natural History Society, Regina, Saskatchewan, pp. 42-43.
12. HOUSTON, C. STUART. 1981. An assessment of Walter Raine and his Saskatchewan records. *Blue Jay* 39:168-181.
13. HOUSTON, M.I. 1986. 44th annual Saskatchewan Christmas bird count, 1985. *Blue Jay* 44:6-18.
14. JOHNSON, A.M. 1967. Saskatchewan journals and correspondence. Hudson's Bay Record Society, Vol. 26, London, p. lxxix.
15. KOES, R.F., and P. TAYLOR. 1992. Prairie provinces region. *American Birds* 46:279-281.
16. LAHRMAN, F. 1961. A second pair of Trumpeter Swans nesting in Saskatchewan. *Blue Jay* 19:18-19.
17. LISTER, R. 1951. Trumpeter Swans breeding in the Cypress Hills of Alberta. *Can. Field-Nat.* 65:157-158.
18. MACOUN, J. 1883. Manitoba and the great north-west. Thomas C. Jack, London, p. 364.
19. —. 1900. Catalogue of Canadian birds. S.E. Dawson, Queen's Printer, Ottawa, pp. 125-126.
20. MILTON, W.F., and W. B. CHEADLE. 1865. The North-west Passage by land. Cassell, Petter & Galpin, London, p.55.
21. MITCHELL, H. H. 1924. Catalogue of the birds of Saskatchewan, *Can. Field Nat.* 38:101-118.
22. NERO, ROBERT W. 1963. Birds of the Lake Athabasca region. Saskatchewan Natural History Society Special Publication #5, Regina, pp. 41-42.
23. NIEMAN, D.J. 1972. Trumpeter Swans in the Cypress Hills. *Blue Jay* 30:93-95.
24. —. 1976. Population status of Trumpeter Swans breeding in Saskatchewan. *Trumpeter Swan Society Newsletter* 9:19-20.
25. —. 1978. 1977 status of Saskatchewan Trumpeters. *Trumpeter Swan Society Newsletter* 15:10.
26. —. 1980. Saskatchewan Trumpeters hang on. *Trumpeter Swan Society Newsletter* 20:6.
27. NIEMAN, D.J., and R.J. ISBISTER. 1974. Population status and management of Trumpeter Swans in Saskatchewan. *Blue Jay* 32:97-101.
28. NIEMAN, D.J., J.K. GODWIN AND J.R. SMITH. 1983. Whistling Swans breeding in Saskatchewan parkland. *Blue Jay* 41:92-98.
29. ROY, J.F. 1957. Operation Trumpeter. *Blue Jay* 15:138-139.
30. SHANDRUK, L., D.F. HOOPER, and R. BEAULIEU. 1992. Trumpeter swans breeding in east-central Saskatchewan. *Blue Jay* 50:107-108.
31. SWAINSON, W., and J. RICHARDSON. 1832. Fauna Boreali-americana, Vol. 2, the birds. J. Murray, London, p. 464.
32. SYMONS, R.D. 1967. Hours and the birds. University of Toronto Press, Toronto, p. 85.
33. TAVERNER, P.A. 1919. Birds of Shoal Lake, Manitoba. *Ottawa Field-Nat.* 32:137-144.
34. TYRRELL, J.B. 1916. David Thompson's narrative of his explorations in western North America 1784-1812. The Champlain Society, Toronto, p. 152.

A MUTE SWAN FLYBY AT SPRINGER LAKE, MANITOBA

PETER TAYLOR, P.O. Box 597, Pinawa, MB. R0E 1L0

Late May and early June is the prime time for "Big Days" in southern Manitoba, when some of the keenest birders indulge their obsession by trying to see and hear as many species as possible in one day. A high total depends on a combination of local knowledge, good weather and good luck. Really rare birds are not often encountered, but occasionally a surprise sighting spices up the day. This note documents one such sighting.

On 21 May 1994, our party of four (Dennis Fast, Gordon Grief, Rudolf Koes and I) had started birding at midnight. Daybreak found us heading into Nopiming Provincial Park in the boreal forest of southeastern Manitoba. At about 7:40 a.m., we paused along Provincial Road 314 near Springer Lake (50°32' N 95°28' W) to look for Palm Warbler, Lincoln's Sparrow and other boreal songbirds. Suddenly, Rudolf called out that a swan was flying towards us. I followed the direction he was pointing, and sure enough there was a great white bird with outstretched neck. Naturally, we assumed it was a Tundra Swan, but as it came closer we heard the throbbing hum of its wingbeats — a diagnostic feature of Mute Swan and a familiar sound from my boyhood in northeastern England. The swan passed within about 150 metres of us, and we could clearly see its pinkish-orange bill with a black base and bulbous knob. Rudolf had the presence of mind to look for leg bands, and saw none. As the bird continued out of sight, heading northeast, we looked

at each other in amazement. On a previous Big Day, 27 May 1989, the four of us had seen a Mute Swan swimming placidly at Oak Hammock Marsh; the Springer Lake sighting was much more dramatic.⁶

Unusual waterfowl sightings always raise questions about origin: wild bird or escapee?⁵ In this case, the question is a little different. Natural origin in Eurasia is inconceivable, but did this swan originate from one of the feral populations in North America, or had it recently escaped from captivity? A check in 1989 revealed only three locations in Manitoba where Mute Swans were kept: Winnipeg Zoo, plus two private collections; no birds were reported missing at the time.

The remote location, the obvious fitness of the bird, and the scarcity of captive Mute Swans in Manitoba suggest that the Springer Lake swan may have originated in the growing population on the Great Lakes.^{3,4} In Minnesota, Janssen suggests that Mute Swans seen away from Lake Superior are probably escaped or [recently] introduced birds, but that birds on Lake Superior have likely wandered from established feral populations in Michigan and Wisconsin.³ I am not aware of any free-ranging Mute Swans in Manitoba; Belcher has described the status of a small, semi-domestic population in Regina.²

Mute Swans are infrequent but capable fliers. Banding studies in Great



Mute Swan at nest (Weedon, England)

Peter Taylor

Britain indicated that most movements are over short distances, but some individuals moved over 100 miles, and one bird banded in Lithuania was recovered on the Solway Firth near the Anglo-Scottish border.¹ Therefore, long-range dispersal is rare, but not out of the question. Two other out-of-the-way Mute Swans in 1994 were reported in *National Audubon Society Field Notes* seasonal reports: at Algonquin Park, Ontario on 2 July and Fort McMurray, Alberta from mid-June to mid-September.

The origins of the Springer Lake bird and other wandering Mute Swans cannot be known with certainty, unless the birds are banded. Nevertheless, it is possible that some Manitoba occurrences are feral birds, as opposed to escapees. It is worth keeping track of this species in the prairie provinces.

1. Atkinson-Willes, G.L. (editor) 1963. Wildfowl in Great Britain: a survey of the winter distribution of the Anatidae and their conservation in England, Scotland and Wales. Monographs of the Nature Conservancy No. 3. Her Majesty's Stationery Office, London, 368pp.
2. Belcher, M. 1980. Birds of Regina (revised edition). Special Publication No. 12, Saskatchewan Natural History Society, Regina. 152pp.
3. Janssen, R.B. 1987. Birds in Minnesota. University of Minnesota Press, Minneapolis, 352pp.
4. Knapton, R.W. 1993. Population status and reproductive biology of the Mute Swan, *Cygnus olor*, at Long Point, Lake Erie, Ontario. *Can. Field-Nat.* 107:354-356.
5. Knapton, R.W. 1994. Exotic waterfowl and the problem of "escapes." *Birders Journal* 3:215-217.
6. Koes, R.F. 1991. Additions to the Manitoba bird list (1985-1990). *Blue Jay* 49:202-207.

BIRDS AND TRANSMISSION LINES

CAROLYN CURTIS, MB.

Reprinted from the
Manitoba Naturalist

In July 1995, George Holland and I were contracted by Manitoba Hydro to conduct raptor surveys along an electrical transmission line. Power outages had been reported from transmission lines 3 and 55 between Oakville and Hwy 14, near Winkler and Morden. The outages were believed to be due to raptor strikes, with reports of hawks being electrocuted. The 81-kilometre stretch along Hwys 13 and 3, which parallels the line, is largely devoted to agricultural use, interspersed with several urban areas, the largest of which is Carman. Our task was to census all bird species, paying particular attention to raptors, within a one-kilometre margin of the line right of way (ROW), and to relate all species to the habitat in which they were found. The level of detail of the field investigations make this the most comprehensive study of its kind in Canada.

The first few weeks of surveying included the time-consuming task of numbering the 822 wood poles and steel towers on the line, as well as recording the specific habitat from pole to pole. All crops, woodlots, shelterbelts, marsh and riparian habitat, and urban areas were noted, along with the corresponding structure number.

The most efficient method by which to gather our information was to walk the ROW, and this we did in a "leap-frog" fashion, so as to cover a greater distance in a given day. The surveys were carried out for an

18-week period from late July to mid-November. We covered the route over three days each week throughout this time. Weather permitting, we worked on consecutive days, but when there were heavy summer rains, or as in November, strong winds reducing visibility, we were forced to postpone the surveys.

Armed with binoculars and clipboards, we usually walked along the line, often in very dense, tall growth, and recorded every bird seen or heard within one kilometre of the ROW. Notes were taken of all birds perched on the structures and wires of the surveyed line as well as on all visible distribution and feeder lines. A few weeks into the study, we began recording the time of day when birds were found perched. It appeared that between 7:00 and 9:00 a.m., fewer birds were perched on the wires. We observed that many individual birds, and indeed, some large flocks, attempted to land on live wires during this time, only to pull away at the last second. Often they would then fly to the ground wire or ignore the wires entirely. It was at such times, when power usage was thought to be high, that the towers could be felt vibrating and a loud humming sound could be heard. We suspected that a vibration on the live wires discouraged the birds from perching; however, more data is required before we can fully understand this interesting phenomenon. Interestingly, we found that some species appeared to have a greater tolerance for this vibration. Mourning Doves, for example, were seen perched on live wires at peak times

of power use far more frequently than any other species, including those which were equally or even more abundant in the area.

Of particular interest to Manitoba Hydro was the occurrence of raptors in the area and their use of structures. Fourteen species of raptors, including two owls, were recorded during the four-month study. Of the 528 individuals, 403 (76%) were Red-tailed Hawks. This is not surprising given that Red-tails are by far the most common hawk in southern Manitoba (Cleveland *et al.* 1988, Cuthbert *et al.* 1990), where they nest across the prairies in wood bluffs (Godfrey 1986). Agricultural land, particularly when cropped, provides excellent habitat for some hawks like Red-tailed, Ferruginous and Swainson's and Northern Harriers, where they soar over the fields in search of prey. Fall migration brought a sharp increase in Red-tailed Hawk sightings in our survey area, with over 70 individuals counted on 11 October, between Carman and Hwy. 14. Most of these birds were hunting, flying low over harvested fields, but many were perched on transmission line structures. The majority of the raptors were recorded in the southern one-third of the survey area. We believe there are many factors contributing to this; however, two major explanations come to mind. Far more woodlots, shelterbelts and creeks are found south of Carman, providing more suitable habitat for nesting raptors. During migration, a larger percentage of raptors continued to be seen in the southern portion of the line, we believe due to the proximity of the Pembina Hills. The Pembina Valley and surrounding hills are a known spring migratory route, and perhaps to a lesser extent, a fall migration route, though fall migration

tends to be more widely spread, not following such narrow corridors.

We also recorded 41 American Kestrels, most of which chose the wires for perches. Northern Harriers were relatively common, due to the suitable habitat, and like all the raptors, their numbers increased during migration. None were seen perched on poles, towers or wires. Several Swainson's and Rough-legged Hawks were recorded in September and October, respectively, and we were rewarded with two Peregrine Falcons and three Ferruginous Hawk sightings, one of which, on 11 October, was the second latest record for Manitoba (K. DeSmet, pers. comm.). Unfortunately, one of the Ferruginous Hawks was an electrocuted specimen, found at the base of a steel tower on 30 August. We later learned that it was an immature female bird banded in 7 July at Kauder, just east of Melita, by Ken DeSmet. Ferruginous Hawks are a vulnerable grassland species, making this a particularly devastating loss.

Three other hawks were found at the base of structures, apparent victims of electrocution. Two were adult Red-tails and one, an immature Red-tail. Photographs were taken, showing the badly burned flight and tail feathers. Ironically, one of the adult Red-tails was found at the base of the same tower as the dead Ferruginous Hawk, a mere 19 days later. All electrocutions occurred at steel towers with short insulators holding the wires above the cross members; an apparent risk factor to perching raptors.

Power poles and towers provide convenient perches for many raptors, from which they keep a keen eye for prey; however, these perches

can sometimes become a death trap for birds when landing or taking off. Should any part of the bird come in contact with one live wire no harm is done, but contacting a live wire and any part of a steel tower simultaneously, will result in electrocution. The large wingspans of many raptors, like buteos, eagles and larger owls, make electrical structures perilous perches. Many steel towers in a section of the line north of Elm Creek had been equipped with either Bird-be-gones (BBG) or metal triangles on their cross members. The pointy, finger-like projections on the BBGs make perching unappealing, as does the triangle that spans the cross member. One or more of these devices, appropriately placed on cross members supporting live wires, deterred raptors from landing there. We recorded no hawks perched on these devices, though they were observed to perch elsewhere on the towers; no electrocuted hawks were found at the base of towers armed with BBGs or triangles.

During the course of the surveys, we found many avian fatalities, though only four were apparent electrocutions. Obvious road-killed birds were not included in our research, but 31 birds were found dead under the line. The migration period produced the greatest occurrence of bird-wire collisions. Rails were particularly vulnerable; as we found five dead Soras and two dead Virginia Rails. Two dead Common Night-hawks were found, one with a severed wing, and four Barn Swallows, as well as many other species. In total 35 birds of 22 species were recorded as power line-related mortalities. It is likely that we only recovered a percentage of dead birds along the line. Though we began our work at sunrise every morning, scavenging animals, such as fox, skunks, and fe-

ral cats prowl before the light of day and are adept at learning where to find food.

During the four-month study, we recorded birds of 148 species, some of which we found pleasantly surprising. Abundant summer species were Savannah Sparrow, Red-winged and Brewer's Blackbirds, Mourning Dove, and Cliff and Barn Swallows. Rock Doves, House Sparrows and European Starlings, as expected, were abundant in urban areas and at farm homesteads. Commonly seen summer species were Red-tailed Hawk, Eastern, and to a lesser extent, Western Kingbirds, Blue Jay, Black-billed Magpie, American Crow, House Wren, Cedar Waxwing, Clay-colored, Vesper and Song Sparrows, Western Meadowlark, and American Goldfinch.

During fall migration, we were amazed at the abundance of some species. American Golden Plover was a species we expected to see in small numbers, due to their preference for feeding in ploughed fields; we never expected to see them in the large, concentrated flocks we found. They began to appear in mid-September, numbering in the tens and twenties, but by 27 September, we counted an unprecedented 900 in a harvested bean field, south of Jordan, only to be surpassed on 11 October with over 1,200 feeding in a harvested canola field, also south of Jordan. Wave after wave of these graceful fliers maneuvered in unison over the field, in the acrobatic flight perfected by shorebirds. It was an awe-inspiring sight!

Snow Geese were abundant migrants from mid-September to early October. There were days when their honking calls could be heard almost continuously as they



TV tower kills

J.B. Gollup

passed overhead. We counted flocks ranging in size from 10 birds up to 6,000. Some smaller groups flew low enough to afford us convincing looks

at accompanying Ross' Geese, six in total.

As autumn progressed, numbers

of American Pipits and Lapland Longspurs also increased, with American Pipits peaking in early October. We counted over 1,600 of them between 25 September and 18 October, many flocks numbering in the hundreds, as was the case with Lapland Longspurs.

On 31 October, we watched in wonder as flock upon flock of Mallards criss-crossed the sky. We estimated over 65,000 individuals, many of which were feeding in nearby stubble fields. It seemed as if every Mallard in Manitoba chose that day to migrate, right along our survey route. Interestingly, the next day yielded an early winter, bringing a heavy snowfall.

The whole project proved to be a learning curve for both George and me. Identifying grain crops, especially in their early growth, was sometimes challenging. It was important that we not only record bird occurrence and mortality, but develop a keen understanding of the effects of power lines on avian life, and examine all contributing factors to current and related problems. We gathered and analyzed a vast amount of data from our field work, and developed several hypotheses and recommendations pertinent to the project. In our raw data, one can find information that would be of value not only to Manitoba Hydro, but also to other naturalists and to the Department of Agriculture. As an example, we recorded the occurrence of Leafy Spurge (*Euphorbia esula*) along the route, finding it around poles, in ditches and even invading woodlots, and provided this information to the Department of Agriculture in Carman to assist them in their endeavour to

eradicate this invasive, noxious weed.

Over the course of the survey, we watched summer fade to autumn, then winter, leaving fewer and fewer birds in this progression of seasons. We began the surveys in the sweltering 30°C days of July and August, protected by sun screen and Tilley hats. We watched young crops grow and flourish; flax fields turning from a heavenly blue to the deep russet of ripeness. We saw stunning prairie sunrises and the approach of fierce electrical storms. We patiently sat out several torrential downpours in the comfort of our car, and relished the freshness across the terrain after such displays. We witnessed the harvest, fascinating for a city-dweller like myself, and felt the cold bite in the shifting winds as autumn progressed. Before long, our rich, growing prairie had progressed into a quiet and barren place, covered with an early winter's snow. We look upon "our line" with a fondness perhaps difficult for others to understand, but this project was far more than a job; it was a wonderful opportunity for learning and enjoying a beautiful prairie landscape in all its richness. We continued working on this project from March to July 1996, and collected a considerable amount of further data.

Literature Cited

- Cleveland, N. et al., 1988. Birder's guide to southeastern Manitoba. MNS - Eco Series No.1.
- Cuthbert, C. et al., 1990. Birder's guide to southwestern Manitoba. Brandon Nat. Hist. Society.
- Godfrey, W.E., 1986. The birds of Canada. National Museum of Natural Sciences, Ottawa.

RECOVERIES OF MOUNTAIN BLUEBIRDS SOUTH OF 49° LATITUDE, AND A RECENT TREE SWALLOW

DONALD J. STILES, 20 Lake Wapta Rise Southeast, Calgary, AB. T2J 2M9

This article outlines the known recoveries of Mountain Bluebirds banded in the four western provinces, and a Tree Swallow recovered since the Tree Swallow article in the December 1994 issue of *Blue Jay*.⁵ All these recoveries are listed in Table 1 and shown graphically in Figure 1.

Long Distance Bluebird Recoveries

A review of data supplied by the Banding Office of the Canadian Wildlife Service for Mountain Bluebirds revealed fourteen long distance recoveries to the south of 49° Lat. These are compiled from 188 recovery listings, nine from the period 1933 to 1941, two from 1949, and the remainder from 1969 to 1994. As this article deals with birds found on their wintering grounds, or on migration in the U.S.A., a number of long distance recoveries found within the prairie provinces will be written up at a later date.

The National Geographic Guide³ and the Third Edition of Peterson's Western Guide¹ show that the wintering grounds for Mountain Bluebirds travelling directly south from the prairie provinces would be to the south of 38° Latitude. This includes the states of Arizona, New Mexico and Texas. Another good source of information on the wintering grounds of the Mountain Bluebird is the *Atlas of Wintering North American Birds*.²

Peak areas of concentrations of Mountain Bluebirds on Christmas Bird Counts include: "open habitat in southeastern Colorado," and "other dense concentrations in the pinon-juniper forest in eastern New Mexico, the open oak-juniper woodland of the Davis Mountains in southwestern Texas, and the sparse creosote bush community of southwestern California."

In Table 1, the recoveries have been separated into those from the wintering grounds and those from migration. The dates for these "wintering ground" recoveries fall into the expected winter months of November to February. Similarly, the recoveries placed in the category "on migration" fall into the expected latitudes from 38° to 49°, and the expected months of March and April, and September and October.

As a sample of the Mountain Bluebird recoveries, details are given for three birds banded in Alberta in June 1986.

1. 971-53775 banded as a young by Preston Winter, a subpermittee of Cam Finlay, near Viking, Alberta 86/06/10, Lat-long: 53°00'-111°40'. Found dead near Grand Junction, Colorado on 86/10/15, Lat-long: 39°00'-108°20'.

2. 961-61248 banded as a young by Ray Woods, a subpermittee of Don Stiles, near Elkton, Alberta on

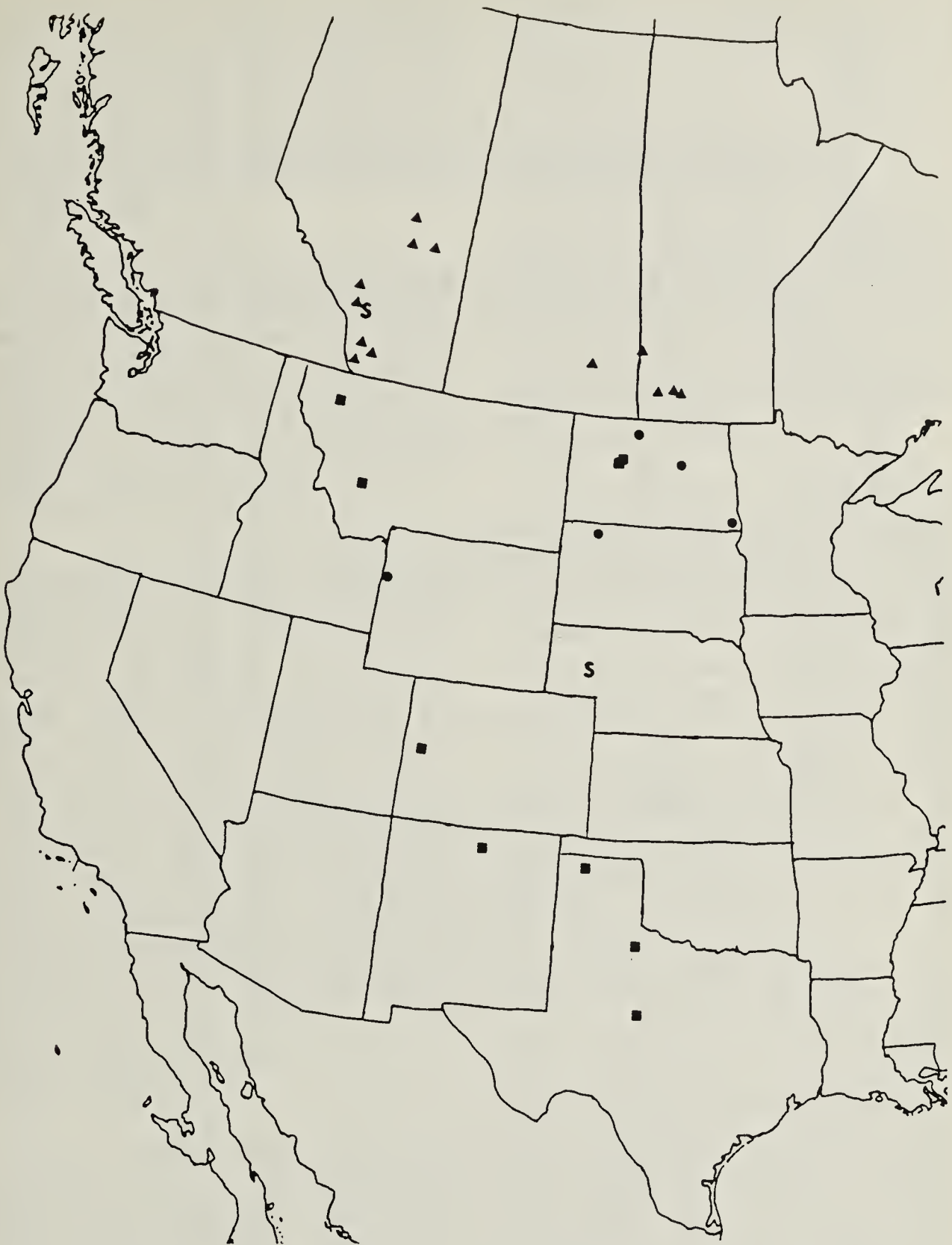


Figure 1. Fourteen Mountain Bluebirds: triangles - banding locations; squares - direct recoveries, the same year as banded; circles - indirect recoveries, in subsequent years. One Tree Swallow: S - banding location (AB) and recovery location (NE).

86/06/22, Lat-long: 51°30'-114°30'. Found dead in a building about 50 miles north of Santa Fe, New Mexico on 87/01/xx, Lat-long: 36°20'-105°40'.

3. 971-59130 banded as a young by Grace Norgard, a subpermittee of Duncan Mackintosh, in the Porcu-

pine Hills southwest of Claresholm, Alberta on 86/06/20, Lat-long: 49°50'-113°50'. Found dead near Chalk, Texas, about 100 miles west of Wichita Falls on 87/01/18, Lat-long: 33°50'-100°10'.

Nos. 2 and 3 found in January 1987 are in agreement with the field

Table 1. OUT-OF-PROVINCE RECOVERIES OF MOUNTAIN BLUEBIRDS BANDED IN THE PRAIRIE PROVINCES, 1939 AND 1969-1994 (AND ONE TREE SWALLOW BANDED IN 1995)

Where Banded						Where Recovered						
Bander	Band No.	Age*	Lat./Long.	Loc.	Date	Lat./Long.	Loc.	Date**	Age	How***	Dist. (km)	Degrees
Mountain Bluebirds Recovered on Wintering Grounds (South of 38 Lat.) - November to February												
A.L. Wilk	381-08471	L	53 00'/112 40'	AB	39/06/09	32 00'/100 00'	TX	39/11/xx	0	98	2550	152
J.C. Finlay	741-83507	L	53 40'/112 50'	AB	71/06/26	36 10'/102 00'	TX	72/xx/xx	0	14	2120	152
D.J. Mackintosh	971-59130	L	49 50'/113 50'	AB	86/06/20	33 50'/100 10'	TX	87/01/18	0	0	2105	143
D.J. Stiles	961-61248	L	51 30'/114 30'	AB	86/06/22	36 20'/105 40'	NM	87/01/xx	0	21	1830	154
Mountain Bluebirds Recovered on Migration (38 to 49 Lat.) - March and April, September and October												
Brandon U.	780-57691	L	49 50'/99 40'	MB	70/07/08	46 10'/97 00'	ND	75/04/03	4	3	455	153
Brandon U.	800-04242	L	49 40'/100 20'	MB	71/06/03	48 30'/101 10'	ND	74/03/18	2	45	205	143
Brandon U.	800-19382	L	49 40'/99 20'	MB	72/07/01	47 40'/99 10'	ND	75/01/01 (?)	2	21	225	177
Brandon U.	800-18013	L	49 40'/99 20'	MB	72/06/04	45 40'/102 30'	SD	76/03/11	3	0	505	209
J.C. Finlay	961-49523	L	49 20'/114 00'	AB	84/06/10	46 00'/112 30'	MT	84/09/19	0	13	375	190
J.C. Finlay	961-49211	L	49 40'/113 20'	AB	84/06/11	43 30'/110 40'	WY	85/10/07	1	0	715	163
R.L. Scott	1231-11464	L	50 20'/103 30'	SK	85/07/17	47 50'/101 50'	ND	86/04/16	0	0	305	156
J.C. Finlay	971-53775	L	53 00'/111 40'	AB	86/06/10	39 00'/108 20'	CO	86/10/15	0	0	1580	169
D.J. Stiles	8031-51615	L	51 00'/114 30'	AB	90/06/23	48 10'/114 10'	MT	91/04/15	0	12	315	176
J.C. Finlay	8011-26536	L	50 50'/101 20'	MB	91/06/09	47 50'/101 50'	ND	92/04/21	0	0	335	186
Tree Swallow												
D.J. Stiles	2151-38482	L	50 40'/114 00'	AB	95/07/10	41 40'/102 20'	NE	95/09/22	0	0	1345	134

* Age: L - Local, unable to fly; ** Date: xx - unknown;

*** How Codes: 0 - found dead (6 Mountain Bluebirds, 1 Tree Swallow); 3 - caught due to injury (1); 12 - caught by cat (1); 13 - killed by flying into stationary object (1); 14 - killed by automobile (1); 21 - found in building (1 alive, 1 dead); 45 - found dead on highway (1); 98 - band only obtained (1)

guide maps indicating where Mountain Bluebirds spend the winter at the latitude of Arizona, New Mexico, and Texas. No. 1 found in Colorado in October 1986 was believed on its way to its wintering grounds in one of the above states.

This is a different migration pattern than that of Tree Swallows, which head southeast toward the Mississippi River system⁵ to be near water on their migration. Mountain Bluebird recoveries shown in Table 1 and Figure 1 indicate that these birds migrate over the Great Plains.

Considering the large number of birds banded it is surprising that only fourteen Mountain Bluebird bands have been recovered in the U.S.A. These include 18,059 banded by Cam Finlay from 1971 to 1994, 14,278 by Don Stiles from 1981 to 1994, 32,787 by Duncan Mackintosh from 1980 to 1994, and 6339 by Lorne Scott from 1969 to 1990 (includes subpermittees in all cases). Numerous Mountain Bluebirds have also been banded in Saskatchewan and elsewhere in Alberta by other banders who have not yet had a recovery reported.

Of the fourteen Mountain Bluebird recoveries listed in this article, all except one were found dead. The bluebird found alive, 800-19382, was recaptured in a building. (The date on this one, 75/01/01, looks incorrect. It has been assumed to be a spring migrant.) Cause of death is given for eight. (See Table 1 under "How Codes"); for the other six, the code just reads "found dead." All fourteen birds were banded as nestlings. Nine were recovered before their first birthday, one was one year old, two were two years old, one three years old and one four years old. Of the ten bluebirds recovered

on migration, seven were found on spring migration, and three on fall migration.

Long Distance Tree Swallow Recovery

On 10 July 1995, Stan Palmer banded 2151-38482 as a nestling in a nest box on his bluebird trail about 3 km south of Dewinton, AB (about 24 km south of Calgary, or 8 km north of Okotoks). Stan is a subpermittee of Don Stiles.

It was found dead on 22 September 1995 at Crescent Lake National Wildlife Reserve, Nebraska and reported by Bill Behrends, a wildlife officer at the reserve. Bill added that thousands of swallows had perished in a severe storm which had given continuous rain with strong winds over two days and night time temperatures down to 0°C for two days and -3°C on 22 September. Frost is normally later at this latitude, he indicated.

His maintenance man had swept about 100 dead swallows out of the horse trailer and many were found dead in other structures; some were seen dead on the ground. Most were Barn and Cliff Swallows but a few Tree Swallows were seen as well. 2151-38482 was found in a shop building. Four or five were found dead in a Barn Swallow nest on a porch light where they had gone to spend the night.

The Crescent Lake National Wildlife Refuge, situated half way between Ellsworth and Oshkosh in the sand hills of Nebraska, is mostly grassland with a high water table and many ponds. Bill indicated that they see many swallows on migration in both spring and fall.

This is the westernmost long-

distance recovery of Tree Swallows banded in the Calgary area. Two of these were recovered in 1992 from eastern south Dakota, and coastal Louisiana.⁵ The timing of the recovery on 22 September is also interesting. The bird was about half way between its nesting site and coastal Louisiana where swallows are seen in large numbers in late November or early December.⁴ They push further south in late December or January.⁴ This recovery compares in timing and latitude with one found in Missouri, a bird banded near Saskatoon, SK on 2 July 1987 and recovered 2 September 1987.⁵

Acknowledgements

I would like to acknowledge the

assistance of Stuart Houston, who prepared the map and edited earlier drafts of this article.

1. PETERSON, ROGER TORY. 1990. A field guide to western birds (3rd ed.). Houghton Mifflin Company, Boston.
2. ROOT, TERRY. 1988. Atlas of wintering North American birds. University of Chicago Press, Chicago.
3. SCOTT, SHIRLEY L., Editor. 1983. Field guide to the birds of North America. National Geographic Society, Washington, D.C.
4. STEIN, R. 1993. Tree Swallow staging area. *Louisiana Ornithological Society News* 154:1-3.
5. STILES, D.J. AND M.I. HOUSTON. 1994. Distant travels of Tree Swallows of the prairie provinces 1968-1992. *Blue Jay* 52(4): 206-212.



Mountain Bluebird

G.W. Beyersbergen

A REPORT OF THE OCCURRENCE OF A BLUE-GREEN ALGA, *ANABAENA*, IN CELLS OF A GREEN ALGA, *RHIZOCLONIUM*

M.V.S. RAJU and BERNARD DE VRIES, George F. Ledingham Herbarium, Biology Department, University of Regina, Regina, SK. S4S 0A2

Anabaena and *Rhizoclonium* are filamentous (thread-like) algae (Fig. 1 A, B) which occur in great abundance in the lakes of southern Saskatchewan, often contributing to the formation of algal blooms.⁴ *Anabaena*, a self-sustaining, photosynthesizing and free-floating alga, is classified as a prokaryote (cells containing primitive or unorganized nuclei), blue-green alga or a cyanobacterium. *Rhizoclonium*, which is also a self-sustaining and photosynthesizing green alga, is classified as an eukaryote (cells with true organized nuclei). In the early stages of their development, the branched filaments of this alga remain attached to various substrata, such as rocks, plants, etc. The filaments, when mature, get detached from the substrata to become free-floating. These filaments fragment profusely, contributing to the algal abundance or bloom in lakes.⁴

Often, the large cells of *Rhizoclonium* filaments, when examined under a compound microscope, will contain many short filaments of *Anabaena*, indicating some sort of mutualistic (symbiotic) relationship of both kinds of algae (Fig. 1C). It is not clear, at present, how these filaments enter into the vegetative cells of the host alga, *Rhizoclonium*. It is, however, well known that cells of *Anabaena*, within the host cells or out-

side, can fix elemental nitrogen from the atmosphere and also secrete many nitrogenous products, which, no doubt, benefit the growth of the host alga and perhaps also other aquatic plants in the same ecosystem.⁵

The cells of the host filament, *Rhizoclonium*, collected late in the growing season (September-October) become modified into thick-walled cells, called akinetes (Fig. 1D, E). These akinetes, which are asexually reproducing structures, may over-winter until the following spring when they germinate to produce new filaments or trichomes. The occurrence of many akinetes (Fig. 1D, E) in the host filaments is quite common and significant, indicating that the alga does indeed reproduce predominantly by asexual means.⁶ This type of asexual reproduction in *Rhizoclonium* is known to be promoted by excessive production of nitrogenous substances produced by the endophytic (living within) *Anabaena* trichomes.¹

The exact physiological relationship between *Rhizoclonium* and *Anabaena* is not clear. The filaments of the latter do, however, live within the vegetative cells of *Rhizoclonium*. The green cells of the former, on the other hand, facilitate the lodging of

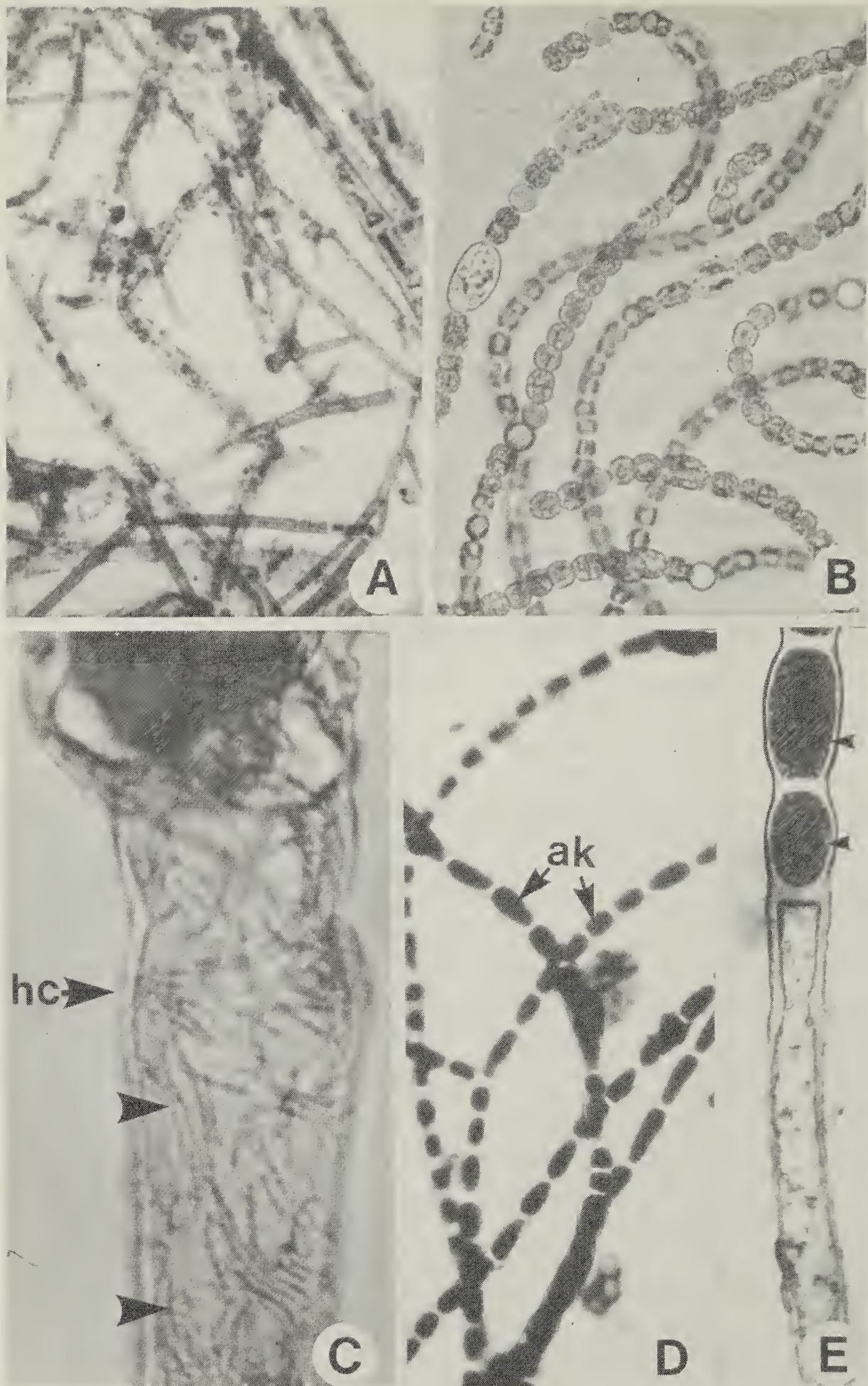


Figure 1. *Rhizoclonium* sp. and *Anabaena* sp. filaments collected from Wascana Lake. A, vegetative filaments of *Rhizoclonium* (green alga). x 40. B, filaments or trichomes of *Anabaena* (blue-green alga). x 340. C, Enlarged view of a vegetative cell (hc, host cell; arrow heads indicate endophytic trichomes of *Anabaena*) of *Rhizoclonium* containing many endophytic trichomes of *Anabaena*. x 900. D, Filaments of *Rhizoclonium* collected late in July showing chains of akinetes (ak), asexually reproducing cells. x 90. E, Enlarged filament of *Rhizoclonium* with akinetes (small arrow heads). x 315.

the *Anabaena* filaments, which, in turn, provide different nitrogenous compounds that are necessary for the growth in abundance of the host filaments. This is somewhat similar to the occurrence of a blue-green alga, *Richelia*, thriving in *Rhizosolenia*, a single-celled aquatic diatom (an alga), and ecologically a successful genus.⁶ There are many instances where the blue-green algae live in other plants and help in atmospheric nitrogen assimilation.^{1,2,3} The present note reports the endophytic nature of a blue-green alga, *Anabaena* in the vegetative cells of a green alga, *Rhizoclonium*, both of which independently form important components of algal blooms in lakes of southern Saskatchewan.

References

1. BOLD, H.C. and M.J. WYNNE. 1978. Introduction to the algae: structure and reproduction. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.
2. DESIKACHARI, T.V. 1959. Cyano-phyta. Indian Council of Agricultural Research, New Delhi.
3. LEE, R.E. 1989. Phycology. 2nd edition. Cambridge University Press, New York.
4. RAJU, M.V.S., J.E. HINES and L.A. PENDLEBURY. 1972. Algal blooms. *Blue Jay* 30:56-61.
5. STEWART, W.D.P. 1973. Nitrogen fixation. pp. 260-278. In: CARR, N.G. and WHITTON, B.A. editors. The Biology of the blue-green algae. The University California Press, Berkeley, California.
6. WEST, G.S. and F.E. FRITSCH. 1927. A treatise on the British fresh-water algae. Cambridge University Press, London, UK.

WANTED

Rare Reptile and Amphibian Observations for the status report for COSEWIC (Committee on the Status of Endangered Wildlife in Canada). If you have any observations of Western Hognose Snake, Plains Spadefoot Toad, Great Plains Toad or Prairie Rattlesnake send them, as soon as possible, to COSEWIC Status Reports, Saskatchewan Herpetology Atlas Project, Box 1574, Saskatoon, SK. S7K 3R3. ANY observation (even if only approximate for date, number, etc.) is important. Andrew Didiuk (home: 306-373-2213/ office: 306-975-4005/fax: 306-875-4089).



Franklin's Lady's Slipper

Blake Maybrook

SASKATCHEWAN CHRISTMAS MAMMAL COUNTS — 1996

Compiled by Wayne C. Harris, Saskatchewan Environment and Resource Management, 350 Cheadle Street West, Swift Current, Saskatchewan. S9H 4G3

The number of mammal counts conducted this year was 82 up from the 78 last year but below the record 84 in 1994. The number of species recorded was 39, up slightly from last year's 38. The average number of species per count (6.89) was down from the past few years and was below the 10-year average of 7.1.

Weather was more harsh than has been reported for most years. Temperatures were colder and there was more snow cover than usual. A Black Bear at Kamsack was the only species not previously reported from past mammal counts. Rarely reported species included Swift Fox reported from Govenlock and flying squirrels from Turtle Lake and Good Spirit Lake. Warm weather species were less prevalent though Piapot did see a Richardson's Ground Squirrel.

The most commonly reported species was White-tailed Deer followed by Coyote and White-tailed Jack Rabbit. Most populations appeared stable. An exception was Lynx that was found on three counts compared with none in 1995.

For weather, coverage and participants please refer to the Christmas Bird Count found elsewhere in this issue. Numbers appearing before the count location name in the tables refer to the location of the count on the map included with the bird count. In the tables, a numeral alone shows that the mammals were seen, while a letter preceding the number means that the number was inferred by the means defined below. A letter alone means that the species was present but estimating the numbers was impossible or that no attempt was made to do so. Some counts have included the numbers of animals seen, plus an estimate

of the number present by tracks, as well as freshly dead animals found.

T = tracks

L = active lodge or hut

D = dead animal found

d = fresh diggings found

S = smell or odour

H = heard

+ = present during the count period (December 20 to January 5) but not found on count day.

Table 1-1. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

SPECIES	LOCATION AND DATE	1. ARCHERWILL 26 December 1986	2. ARMIT 3 January 1987	3. ASSINIBOIA 4 January 1987	4. BANGOR 5 January 1987	5. BETHUNE 4 January 1987	6. BIGGAR 28 December 1986	7. BIG RIVER 28 December 1986	8. BIRCH HILLS 20 December 1986	9. BRIGHTWATER R. 21 December 1986	10. BROADVIEW 27 December 1986
MASKED SHREW											
SHREW species											
NUTTALL'S COTTONTAIL											
COTTONTAIL species											
SNOWSHOE HARE		T(10)	T(30)	13	T(2)		T(3)	T(2)	T(29)		T(23)
WHITE-TAILED JACK RABBIT				14		2	T(3)		T(1)	T(3)	T(5)
RICHARDSON'S GROUND SQUIRREL											
GREY SQUIRREL											
FOX SQUIRREL					+						
AMERICAN RED SQUIRREL		T(2)	9					2	1 +T(2)		5 +T(4)
NORTHERN FLYING SQUIRREL											
NORTHERN POCKET GOPHER											
AMERICAN BEAVER			L(1)								
DEER MOUSE											
GAPPER'S RED-BACKED VOLE											
MUSKRAT											
MEADOW VOLE											
VOLE species							T(7)				
MOUSE species		1 + T(10)	T(2)						T(6)		T(9)
NORWAY RAT											
HOUSE MOUSE											
AMERICAN PORCUPINE			T(1)						T(1)		7 +T(1)
COYOTE		2 +T(2)	T(1)	7	T(5)	1	1	T(1)	T(5)		1 +T(5)
WOLF			T(3)								
RED FOX			T(1)	1			T(1)	T(1)		1	
SWIFT FOX											
BLACK BEAR											
RACCOON											
ERMINE									T(3)		T(1)
LONG-TAILED WEASEL					+				T(2)		
LEAST WEASEL									T(2)		
WEASEL species			T(1)				T(1)				
AMERICAN MINK											
AMERICAN BADGER											
STRIPED SKUNK											
RIVER OTTER											
LYNX											
FERAL CAT											
MULE DEER				15							
WHITE-TAILED DEER		2 + T(50)	2	66	14		11	T(4)	T(3)		11 + T(37)
DEER species											
MOOSE		2 +T(2)	1				+				T(3)
AMERICAN ELK			T(70)								
PRONGHORN											
TOTAL SPECIES		6	12	6	5	2	8	5	10	2	9

Table 1-2. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

11. BROMHEAD 5 January 1997	12. CANDLE LAKE 30 December 1996	15. CLARK'S CROSSING 21 December 1996	16. CORONACH 5 January 1997	17. CRAVEN 21 December 1996	18. CROOKED LAKE 21 December 1996	20. CYPRESS HILLS P.P. 30 December 1996	22. DUVAL 28 December 1996	23. EASTEND 3 January 1997	24. EMMA LAKE 1 January 1997	LOCATION AND DATE	SPECIES
											MASKED SHREW
											SHREW species
			5			T(2)		3			NUTTALL'S COTTONTAIL
						T(6)					COTTONTAIL species
	T(50)	T(8)		T(5)			1				SNOWSHOE HARE
		8		T(2)	T		T(6)				WHITE-TAILED JACK RABBIT
											RICHARDSON'S GROUND SQUIRREL
				2							GREY SQUIRREL
											FOX SQUIRREL
	7				2	2			6		AMERICAN RED SQUIRREL
											NORTHERN FLYING SQUIRREL
											NORTHERN POCKET GOPHER
					L	L(2)					AMERICAN BEAVER
						T(1)					DEER MOUSE
											GAPPER'S RED-BACKED VOLE
					1						MUSKRAT
			1								MEADOW VOLE
							T(4)				VOLE species
	T(5)	T(7)					T(10)				MOUSE species
											NORWAY RAT
											HOUSE MOUSE
			3	T(1)		5	T(1)				AMERICAN PORCUPINE
2			1	5	2	8	1				COYOTE
				+T(4)		+T(1)					
	T(1)										WOLF
	T(1)	1	1	T(1)	T		T(4)				RED FOX
		+T(1)									
											SWIFT FOX
											BLACK BEAR
	1							1			RACCOON
											ERMINE
							T(1)				LONG-TAILED WEASEL
	+										LEAST WEASEL
											WEASEL species
	T(1)				T			1			AMERICAN MINK
											AMERICAN BADGER
											STRIPED SKUNK
									+		RIVER OTTER
											LYNX
											FERAL CAT
3			116			21		8			MULE DEER
136	19	2	25	45	22	52	7	16			WHITE-TAILED DEER
		T(6)									
		2					T(15)				DEER species
		+T(2)									
	T(1)					4					MOOSE
	5					168					AMERICAN ELK
						18					PRONGHORN
3	11	6	7	7	8	12	9	5	2		TOTAL SPECIES

Table 1-3. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

	LOCATION AND DATE	25. ENDEAVOUR 24 December 1996	26. FENTON 4 January 1997	27. FIFE LAKE 2 January 1997	28. FT. QU'APPELLE 21 December 1996	28. FORT WALSH 21 December 1996	30. GARDINER DAM 23 December 1996	31. GOOD SPIRIT L 28 December 1996	32. GOVENLOCK 22 December 1996	33. GRASSLANDS N.P. 29 December 1996
SPECIES										
MASKED SHREW										
SHREW species										
NUTTALL'S COTTONTAIL			1		5	4		5 +T(2)	4	
COTTONTAIL species										
SNOWSHOE HARE		2 + T(16)		3	T(3)	T(4)	T(13)			
WHITE-TAILED JACK RABBIT	1			+	T(3)	3	T(7)	1 + T(21)	T(25)	
RICHARDSON'S GROUND SQUIRREL										
GREY SQUIRREL										
FOX SQUIRREL										
AMERICAN RED SQUIRREL		3 +T(3)		14	7		3			
NORTHERN FLYING SQUIRREL							3			
NORTHERN POCKET GOPHER										
AMERICAN BEAVER							L(1)			
DEER MOUSE	T			1		1			2	
GAPPER'S RED-BACKED VOLE							1			
MUSKRAT				2			L(8)			
MEADOW VOLE				+				1		
VOLE species					T(5)		T(1)			
MOUSE species		T(1)								
NORWAY RAT				+						
HOUSE MOUSE										
AMERICAN PORCUPINE				1	3	1	2	2 +T(1)	4	
COYOTE	1	2 +T(3)		1	9	9	1	6	7	
WOLF										
RED FOX		T(1)		+	T(1)	T(1)	1		1	
SWIFT FOX								T(1)		
BLACK BEAR										
RACCOON				5						
ERMINE										
LONG-TAILED WEASEL		1					+			
LEAST WEASEL		T(1)								
WEASEL species					T(1)		T(4)		T(2)	
AMERICAN MINK				+						
AMERICAN BADGER									d(1)	
STRIPED SKUNK										
RIVER OTTER										
LYNX										
FERAL CAT										
MULE DEER			17	5	59	62		38	79	
WHITE-TAILED DEER	T	T(11)	11	11	61	69	9	28	48	
DEER species										
MOOSE					T(1)		T(2)			
AMERICAN ELK	T				8					
PRONGHORN									11	
TOTAL SPECIES		5	8	3	14	13	9	13	8	11

Table 1-4. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

34. GRASSLANDS (NW) 20 December 1986	35. GRAYSON 23 December 1986	36. HORSESHOE BEND 30 December 1986	39. HUMBOLDT 28 December 1986	40. INDIAN HEAD 28 December 1986	41. KAMSACK 28 December 1986	42. KELVINGTON 28 December 1986	43. KENASTON 2 January 1987	44. KILWINNING 20 December 1986	LOCATION AND DATE	SPECIES
										MASKED SHREW
										SHREW species
T							T(5)			NUTTALL'S COTTONTAIL
										COTTONTAIL species
			T(8)	6		1 T(10)				SNOWSHOE HARE
2			T(2)	7		T(4)	T(9)			WHITE-TAILED JACK RABBIT
										RICHARDSONSGROUNDSQUIRREL
										GREY SQUIRREL
										FOX SQUIRREL
		1		9				2		AMERICAN RED SQUIRREL
										NORTHERN FLYING SQUIRREL
										NORTHERN POCKET GOPHER
										AMERICAN BEAVER
T(1)							T			DEER MOUSE
										GAPPER'S RED-BACKED VOLE
										MUSKRAT
										MEADOW VOLE
										VOLE species
		T	T(1)			T(2)				MOUSE species
										NORWAY RAT
										HOUSE MOUSE
	2			1						AMERICAN PORCUPINE
H(1)			T(2)	11	4	T(4)	1	2		COYOTE
										WOLF
		1	T(1)	4	1	T(1)	T(5)			RED FOX
										SWIFT FOX
					1					BLACK BEAR
				2						RACCOON
										ERMINE
T(1)							T			LONG-TAILED WEASEL
				1						LEAST WEASEL
										WEASEL species
										AMERICAN MINK
										AMERICAN BADGER
							T			STRIPED SKUNK
										RIVER OTTER
					2					LYNX
										FERAL CAT
6							T(4)			MULE DEER
90	6	5	T(8)	62	17	T(12)	4			WHITE-TAILED DEER
										DEER species
					2					MOOSE
					3					AMERICAN ELK
							8			PRONGHORN
7	2	4	6	9	7	6	10	2		TOTAL SPECIES

Table 1-5. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

SPECIES	LOCATION AND DATE	45. KINLOCH 2 January 1997	46. KUTAWAGAN LAKE 27 December 1996	47. KYLE 26 December 1996	48. LAST MT. L. NWA 26 December 1996	49. LA RONGE 26 December 1996	50. LEADER (N) 29 December 1996	51. LEADER (S) 1 January 1997	53. LOVE - TORCH R. 2 January 1997	54. LUSELAND 5 January 1997
MASKED SHREW										
SHREW species										
NUTTALL'S COTTONTAIL							2	2		
COTTONTAIL species										
SNOWSHOE HARE		1	T(1)	2		T(6)			1	
WHITE-TAILED JACK RABBIT			T(5)		T(25)		T(2)	2		+
RICHARDSON'S GROUND SQUIRREL										
GREY SQUIRREL										
FOX SQUIRREL										
AMERICAN RED SQUIRREL		4				T(3)			3	
NORTHERN FLYING SQUIRREL										
NORTHERN POCKET GOPHER										
AMERICAN BEAVER		L(2)								
DEER MOUSE			T(1)		T(2)			3		+
GAPPER'S RED-BACKED VOLE										
MUSKRAT		L(4)	L(21)		L(1)					
MEADOW VOLE										
VOLE species										
MOUSE species							1			
NORWAY RAT										
HOUSE MOUSE										
AMERICAN PORCUPINE				1	T(2)					
COYOTE		T(4)	6		2 +T(7)		2		1	2
WOLF										
RED FOX			1	1	1 +T(1)	T(1)				1
SWIFT FOX										
BLACK BEAR										
RACCOON										
ERMINE						T(4)				
LONG-TAILED WEASEL					T(1)					
LEAST WEASEL		T(2)								
WEASEL species										
AMERICAN MINK					T(1)	T(2)				
AMERICAN BADGER					d(1)					
STRIPED SKUNK										
RIVER OTTER										
LYNX		T(1)								
FERAL CAT					3					
MULE DEER							21	51		6
WHITE-TAILED DEER			3	31	90		15	6	9	+
DEER species		11								
MOOSE										
AMERICAN ELK		T(25)								
PRONGHORN				15			50			
TOTAL SPECIES		9	7	5	11	5	7	5	4	6

Table 1-6. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

56. MARYFIELD 26 December 1986	57. MEADOW LAKE 26 December 1986	58. MEATH PARK 4 January 1987	59. MELFORT 26 December 1986	60. MELFORT (SE) 26 December 1986	61. MELVILLE 24 December 1986	62. MOOSE JAW 28 December 1986	63. MOOSE MOUNTAIN 20 December 1986	64. NAICAM 3 January 1987	LOCATION AND DATE	SPECIES
										MASKED SHREW
						1				SHREW species
										NUTTALL'S COTTONTAIL
										COTTONTAIL species
T(10)			1		T(3)					SNOWSHOE HARE
1 +T(2)			1			1				WHITE-TAILED JACK RABBIT
										RICHARDSONSGROUND SQUIRREL
						1				GREY SQUIRREL
						3	5			FOX SQUIRREL
	1	2						1		AMERICAN RED SQUIRREL
										NORTHERN FLYING SQUIRREL
										NORTHERN POCKET GOPHER
										AMERICAN BEAVER
					2					DEER MOUSE
										GAPPER'S RED-BACKED VOLE
										MUSKRAT
										MEADOW VOLE
										VOLE species
T(3)										MOUSE species
										NORWAY RAT
										HOUSE MOUSE
2										AMERICAN PORCUPINE
3				1						COYOTE
										WOLF
1 +T(6)					+					RED FOX
										SWIFT FOX
										BLACK BEAR
	1					2				RACCOON
										ERMINE
										LONG-TAILED WEASEL
										LEAST WEASEL
T(1)										WEASEL species
T(2)										AMERICAN MINK
										AMERICAN BADGER
S(1)										STRIPED SKUNK
										RIVER OTTER
										LYNX
										FERAL CAT
										MULE DEER
25 + T(200)			T(3)		3	25	4			WHITE-TAILED DEER
					6					DEER species
										MOOSE
										AMERICAN ELK
										PRONGHORN
10	2	1	3	1	4	6	2	1		TOTAL SPECIES

Table 1-7. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

SPECIES	LOCATION AND DATE	65. NIPAWIN 5 January 1997	66. PIKE LAKE 4 January 1997	67. PRINCE ALBERT 22 December 1996	68. PRINCE ALBERT NP 29 December 1996	69. QU'APPELLE DAM 5 January 1997	70. RAYMORE 25 December 1996	71. REGINA 26 December 1996	72. ROCKGLEN 5 January 1997	73. ROUND LAKE (Q.V.) 2 January 1997
MASKED SHREW							T(1)			
SHREW species										
NUTTALL'S COTTONTAIL										
COTTONTAIL species										
SNOWSHOE HARE			2 + T(1)	T(13) + D(2)	T(8)	T(5)	4 + T(7) T(11)	1		
WHITE-TAILED JACK RABBIT								15		
RICHARDSON'S GROUND SQUIRREL										
GREY SQUIRREL								3		
FOX SQUIRREL										
AMERICAN RED SQUIRREL		3	7 + T(2)	2	27 + T(27)					
NORTHERN FLYING SQUIRREL										
NORTHERN POCKET GOPHER										
AMERICAN BEAVER							L(1)			T(2)
DEER MOUSE							1	T		T(1)
GAPPER'S RED-BACKED VOLE										
MUSKRAT							L(20)			
MEADOW VOLE							1			
VOLE species					T(2)			T		
MOUSE species				T(4)	T(2)	T(4)				
NORWAY RAT										
HOUSE MOUSE				D(1)			1			
AMERICAN PORCUPINE			2	T(3)		4	T(3)	T(1)		
COYOTE				2 + T(1)	T(1)	26	T(4)	3	2	
WOLF					T(10)					
RED FOX				T(2)	2 + T(6)		T(1)	1		
SWIFT FOX										
BLACK BEAR										
RACCOON										
ERMINE					T(1)		T(1)			
LONG-TAILED WEASEL				T(3)			T(1)			T(2)
LEAST WEASEL				T(1)				T(1)		
WEASEL species								T(2)		
AMERICAN MINK										T(2)
AMERICAN BADGER							+			T(2)
STRIPED SKUNK										
RIVER OTTER					T(1)					
LYNX					+					
FERAL CAT										
MULE DEER						2			60	+
WHITE-TAILED DEER			11 + T(18)	7 + T(6)		56	T(11)	23	35	
DEER species					T(7)	3 + T(100)				
MOOSE					T(2)					
AMERICAN ELK					16 + T(38)					
PRONGHORN										
TOTAL SPECIES		1	4	9	13	6	15	10	3	13

Table 1-8. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

74. ROUND LAKE (P.A.) 22 December 1996	75. SK LANDING P.P. 24 December 1996	76. SASKATOON 26 December 1996	77. SCOTT 31 December 1996	78. SHAMROCK 28 December 1996	80. SKULL CREEK 26 December 1996	81. SNOWDEN 4 January 1997	82. SPALDING 4 January 1997	83. SPINNEY HILL 3 January 1997	LOCATION AND DATE	SPECIES
					T(2)	+				MASKED SHREW
					23					SHREW species
	3									NUTTALL'S COTTONTAIL
										COTTONTAIL species
T		2 + T(8)	1	T(4)		T(10)	T	T		SNOWSHOE HARE
	T(25)	12 + T(2)	T(2)		4					WHITE-TAILED JACK RABBIT
					+					RICHARDSONSGROUNDSQUIRREL
										GREY SQUIRREL
										FOX SQUIRREL
2					6	13		3		AMERICAN RED SQUIRREL
										NORTHERN FLYING SQUIRREL
										NORTHERN POCKET GOPHER
										AMERICAN BEAVER
	T(1)	T(3)			T					DEER MOUSE
										GAPPER'S RED-BACKED VOLE
		T(1)								MUSKRAT
					T	T(3)				MEADOW VOLE
		T(1)	T(1)							VOLE species
		T(4)					T			MOUSE species
										NORWAY RAT
						T(12)				HOUSE MOUSE
	2	2 + D(1)			6			2		AMERICAN PORCUPINE
T	2	5	1	1	16	+				COYOTE
										WOLF
T	T(2)	3 + T(3)	T(1)	T(2)	T					RED FOX
										SWIFT FOX
										BLACK BEAR
					T(2)					RACCOON
										ERMINE
					T(3)					LONG-TAILED WEASEL
						+				LEAST WEASEL
	T(1)	T(2)								WEASEL species
					T(3)					AMERICAN MINK
					1					AMERICAN BADGER
					S(1)					STRIPED SKUNK
										RIVER OTTER
										LYNX
										FERAL CAT
	61	T(1)		15	49					MULE DEER
	32	25 + T(24)	T(15)		179	4	T			WHITE-TAILED DEER
		T(22)								DEER species
					T(2)	+				MOOSE
						+				AMERICAN ELK
										PRONGHORN
4	9	11	6	4	18	10	3	3		TOTAL SPECIES

Table 1-9. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

SPECIES	LOCATION AND DATE	84. SQUAW RAPIDS 2 January 1987	85. SWIFT CURRENT 29 December 1986	87. TURTLE L. (E) 1 January 1987	88. TURTLE L. (SE) 2 January 1987	89. WEYBURN 21 December 1986	90. WHITE BEAR 1 January 1987	91. WHITEWOOD 22 December 1986	92. YORKTON 3 January 1987	TOTAL COUNTS
MASKED SHREW										1
SHREW species										2
NUTTALL'S COTTONTAIL			7				+			17
COTTONTAIL species										1
SNOWSHOE HARE		T(8)		6	T	T(7)		T(5)		47
WHITE-TAILED JACK RABBIT		T(1)			T	T(3)	1	T(2)		42
RICHARDSON'S GROUND SQUIRREL										1
GREY SQUIRREL			5							4
FOX SQUIRREL						7		+		5
AMERICAN RED SQUIRREL		13		15	11			2	1	38
NORTHERN FLYING SQUIRREL				1						2
NORTHERN POCKET GOPHER								+		1
AMERICAN BEAVER		L(1)								8
DEER MOUSE		T(2)						T(4)		20
GAPPER'S RED-BACKED VOLE										1
MUSKRAT		L(1)								9
MEADOW VOLE		T(2)								7
VOLE species					T					9
MOUSE species										19
NORWAY RAT										1
HOUSE MOUSE								T(2)		4
AMERICAN PORCUPINE		T(1)				+		1		31
COYOTE		5	10		3		1	4		57
WOLF		1								4
RED FOX		T(1)		1				7		43
SWIFT FOX										1
BLACK BEAR										1
RACCOON										7
ERMINE		T(1)						T(1)		7
LONG-TAILED WEASEL										12
LEAST WEASEL		T(2)								9
WEASEL species		T(2)			T(3)					11
AMERICAN MINK		T(1)								10
AMERICAN BADGER										5
STRIPED SKUNK				1						4
RIVER OTTER		T(2)								3
LYNX										3
FERAL CAT										1
MULE DEER			58				148			25
WHITE-TAILED DEER		10	46	15	T(4)	5	3	6	1	67
DEER species										7
MOOSE		2							1	14
AMERICAN ELK		4								10
PRONGHORN							25			6
TOTAL SPECIES		18	5	6	7	5	6	12	3	

RACCOONS DON'T ALWAYS SHUN CITIES

WALLY KOST, 219 Lake Crescent, Saskatoon, SK. S7H 3A1

Editor's note: This article originally appeared in the *Saskatoon Sun*.

The Raccoon is a greyish or brownish-black animal easily recognized by its black facial mask and ringed tail. The woolly brown undercoat is covered by long guard hairs. Adults have body lengths of 90 cm with tails up to 25 cm long. They average eight kilograms in weight. Their legs are relatively short and the feet are narrow, with five long, finger-like toes. The front feet are especially sensitive and agile. The Raccoon uses them skillfully to manipulate food and objects, hence the common name "Raccoon" which originates from its Algonquin name "Arakunem," meaning literally "he who scratches with his hands."

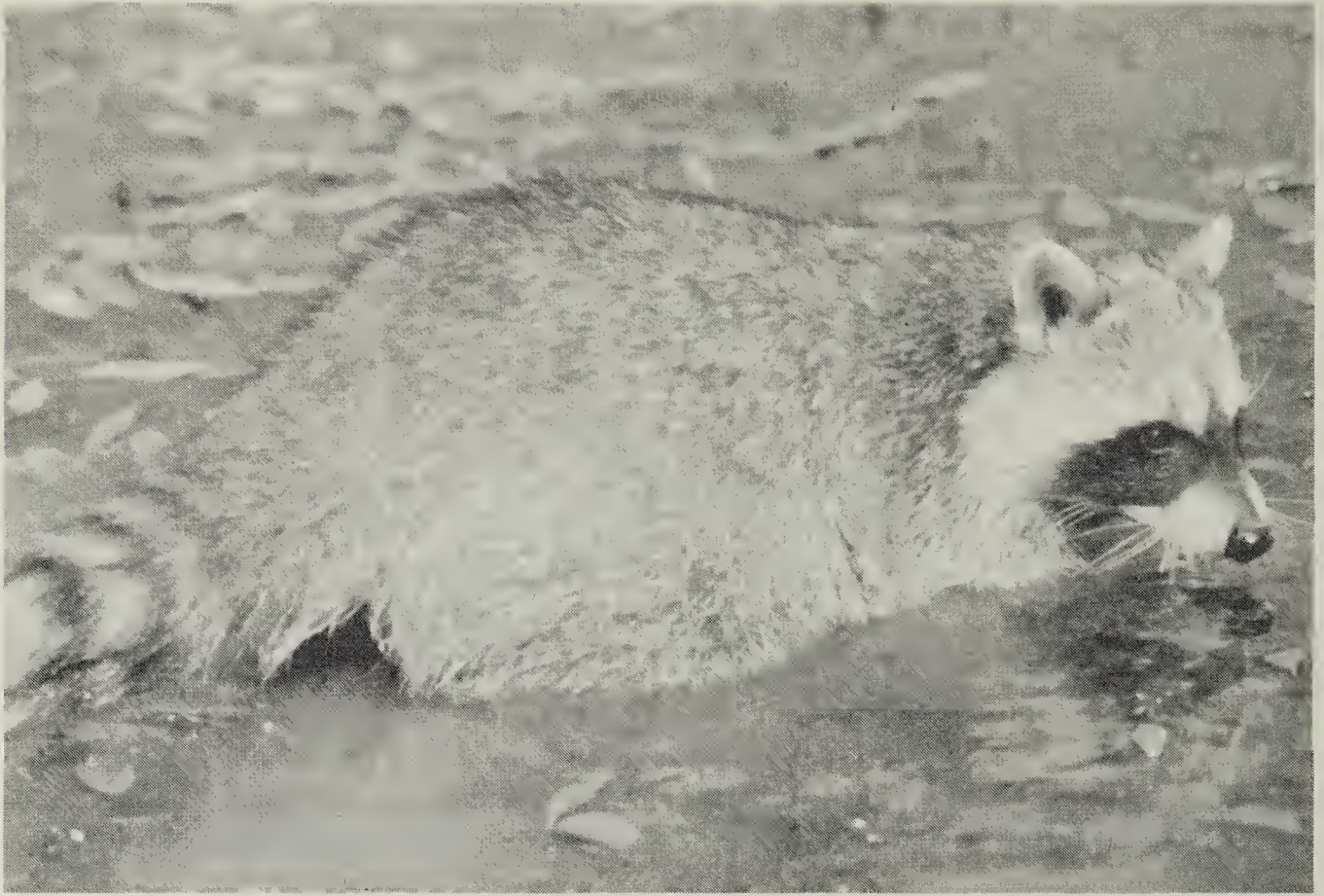
The young, usually three or four, are born in mid-April to mid-May. Their eyes remain closed for about three weeks. By six weeks the young leave the den to explore and feed. They remain together as a family through the first winter. The following spring, the young lose the instinct to follow their mother and soon disperse to begin life on their own.

The Raccoon is omnivorous. It will eat anything available, including carrion, garbage, birds, insects, crayfish and plant material. Contrary to popular belief, Raccoons in the wild do not wash all their food.

Raccoons are nocturnal. Because

they are most active at night, we don't often see them in the wild. They are colour blind, but have excellent night vision. They are good climbers and aggressive when threatened. Considered to be intelligent animals, they seem to have the ability to learn from experience and pass on learned behavior to other Raccoons. Raccoons are extremely adaptable and occur in a wide variety of habitats. Riparian habitat such as the South Saskatchewan River valley is important Raccoon habitat for den sites and as a travel route. They first appeared in southeast Saskatchewan following Coyote reduction programs of the 1950s, and have expanded dramatically north and west since. The Raccoon's relationship to the Coyote is emphasized by a study of waterfowl predators in Saskatchewan from 1983 to 1988, which showed a decline in the abundance of Raccoons with an increase in the abundance of Coyotes.

Raccoons are suited to co-existence with humans and have benefited greatly from agricultural and urban development. While the preferred habitat is forested areas near water, Raccoons may be found in upland forests, prairies and cities. Metropolitan Toronto has one of the highest densities of Raccoons in Canada. Raccoons' preference for wetland habitat makes them important predators of ducks and other waterbirds which nest near or over water. Their ability to climb allows



Raccoon

them to predate eggs of tree-nesting birds.

Raccoons use hollow trees, ground burrows, and abandoned buildings as dens for rearing young and for shelter. The Raccoon is not a true hibernator, but becomes inactive during severe winter weather. Raccoons often share dens to conserve warmth. They may store food, but they usually rely on body fat reserves, which make up to one-half of their fall body weight, to sustain them through inactive periods when snow depth limits available food. The last 10 years of relatively mild winters in Saskatchewan have contributed to Raccoon survival.

The Raccoon roundworm has been identified as a potential health hazard for humans, although the

Raccoon is not seriously affected by this internal parasite. However, ingestion of the eggs by an intermediate host, including man, can lead to health problems. Rabies and canine distemper are also important causes of Raccoon mortality. Because of their usual nocturnal nature, Raccoons encountered during daylight hours should be avoided.

Editor's note: As I was making the last corrections to this issue I was saddened to learn of the tragic death of Wally Kost and two of his colleagues. They were estimating deer populations when their light plane crashed. Many readers know Wally as a fine, energetic young man whose talents and contribution to society will be missed. Our sympathy goes to his wife, children and family.



"THE ROCK PILE," CYPRESS HILLS, SASKATCHEWAN

RUDY W. KLASSEN, Geological Survey of Canada, 3303 - 33 St. N.W.,
Calgary, AB. T2L 2A7

The origin of an unusual arrangement of sandstone blocks near Fort Walsh National Historic Park in the Cypress Hills of southwestern Saskatchewan (Figure 1) has long been a topic of speculation by visitors to the site (Anderson, 1989). Known locally as "The Rock Pile," this feature is on the crest of a ridge along the west side of Battle Creek Valley (Figures 2, 3) which separates two heights of land, the upper one referred to as the West Block. Speculation concerning the origin of this feature has its basis in the man-made appearance of closely fitted rectangular and square-shaped blocks of sandstone at the terminus of the ridge crest (Figures 4, 5, 6). Boulders, which elsewhere on the ridge crest appear somewhat scattered, form a platform about 20 by 30 m at the terminus. This arrangement of blocks with flat faces at right angles, contrasts with the wider spacing and scattered nature of generally smaller blocks and semi-rounded boulders elsewhere on the crest of the ridge (Figure 3). A cursory survey of this site leaves one with the impression that intelligent beings arranged the blocks. This aspect gave rise to the suggestions that it may have been "the farthest northern outpost of the Mayan or Aztec civilizations" and that it led aboriginal people to refer to the area as "the dreaded hills" (Anderson, 1989).

Study of the site in a geologic and geomorphic context leaves no doubt that it was formed by natural processes and that the role of man appears to be restricted to inscriptions and graffiti seen on some of the exposed rock faces. A natural origin does not, however, detract from the uniqueness of the site and its setting in this part of the prairies. Unlike the surrounding prairie landscapes that were shaped by the last glaciation and its meltwaters about 15,000 years ago, the upper surfaces of the West Block and the main part of the valley occupied by Battle Creek were never glaciated (Klassen, 1991, 1992). The indirect effects of glaciation are, however, evident along the lowest part of the valley which formed as a glacial meltwater channel (Figure 7).

The geologic succession exposed along the sides of the preglacial valley consists of several rock formations (Figure 7). The lowest formations (Frenchman and Bearpaw) consist mainly of soft, erodible silt and clay, whereas the overlying Ravenscrag Formation consists of loose sand in places cemented by carbonates into a massive sandstone. A cap of bouldery gravel (Cypress Hills Formation) forms a resistant surface over the highest parts of the West Block.

The positions of the sandstone blocks and the patterns they form along the terminus of the ridge crest (Figures 4, 6) reflect their origin within the Ravenscrag Formation and the effects of natural phenomena known as joint systems. The sandstone bodies seen in exposures of the Ravenscrag Formation range in size from elongate, bed-like forms tens of metres long to ovoid pods several metres long enclosed in loose sand. Joints are fractures or breaks formed in rock bodies as a result of the nature of the rock properties and the effects of other natural processes. Where vertical joint systems occur in large rock masses, they may form various surface patterns such as the hexagonal ones on some lava beds or rectangular to square patterns as seen at "The Rock Pile." The closely spaced blocks along the ridge crest result from vertical joint systems in a large body of sandstone that remains in its original position. Sets of continuous joints are oriented in a north-south trend and sets of shorter, offset joints along an east-west trend (Figures 4, 6). The upper surfaces of the blocks reflect the former contact of the sandstone body with the enclosing sand, whereas the bottoms remain imbedded in soft sediments protected from erosion by the blocks (Figure 5). Blocks and boulders elsewhere on the ridge (Figures 2, 3) originated from smaller sandstone bodies. They have been separated and scattered to a greater degree than the blocks along the terminus of the crest as a result of the erosion of the enclosing sand and further separation by slope processes such as rock creep, whereby individual blocks move slowly downslope.

Boulders resting on the surface of the blocks along the terminus of the ridge crest (Figure 6) were likely lowered on to the surfaces when the support of loose sand was removed by erosion. Various degrees of roundness of sandstone boulders (Figure 3) and bowl-shaped weathering pits on the upper surfaces of the closely spaced blocks (Figure 8) reflect prolonged weathering. These exposures may date back to the time when valley excavation began some five million years ago. The cap of sandstone blocks along the terminus of the crest will in time be removed as a result of erosion and rock creep. Exposed rock surfaces will undergo more intensive weathering and resemble the scattered rocks seen on parts of the ridge and elsewhere along the valley sides.

"The Rock Pile" will likely continue to fuel speculation concerning its origin because it is an unusual and intriguing display of the results of natural phenomena.

References

- ANDERSON, F.W. 1989. Fort Walsh and the Cypress Hills Gopher Book No. 8, Privately published by F.W. Anderson, Regina Saskatchewan.
- KLASSEN, R.W. 1991. Surficial geology and drift thickness, Cypress Lake, Saskatchewan Geological Survey of Canada, Map 1766A, scale 1:250,000
- . 1992. Nature, origin and age relationships of landscape complexes in southwestern Saskatchewan. *Geographie physique et Quaternaire* 46: 361-388.
- WHITAKER, S.H., 1967. Geology and groundwater resources of the Cypress Lake (72F) area, Saskatchewan Research Council Geology Division, Map No. 22.

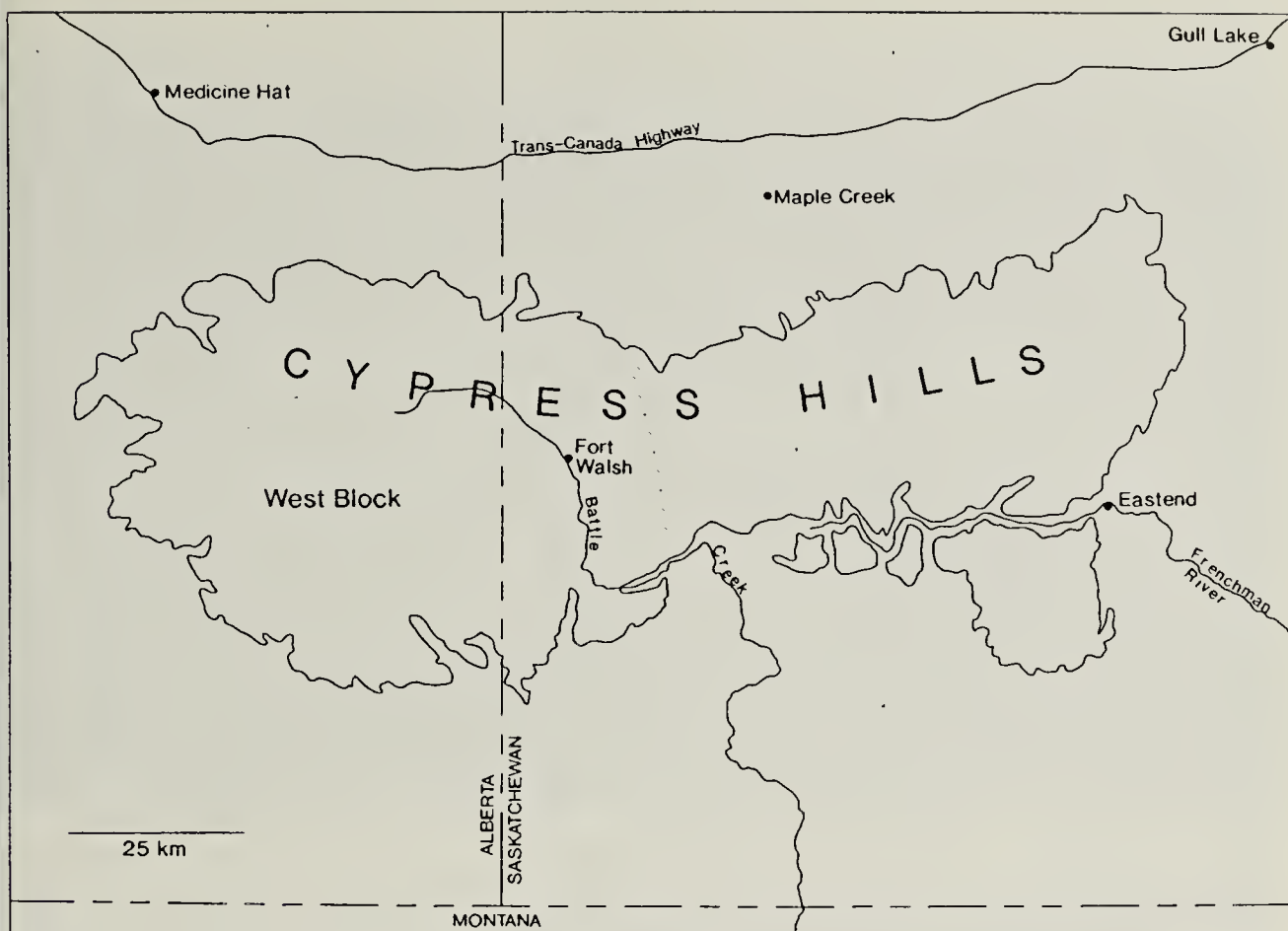


Figure 1. Map showing the location of Fort Walsh National Historic Park in the Cypress Hills of southwestern Saskatchewan.



Figure 2. Ridge capped by sandstone blocks referred to locally as "The Rock Pile" (SE 1/4 sec. 8, tp. 7, rge. 29, W3) along the west side of the preglacial Battle Creek Valley. Sandstone and sand of the Ravenscrag Formation forms the highest part of the ridge to the left and a residual of sandstone boulders covers the lower part of the ridge to the right. View is north towards the upland surface on the horizon. ISPG photo 4173-8.



Figure 3. Rocks on the ridge crest in the foreground are weakly aligned residuals of closely spaced blocks similar to the ones capping the ridge terminus shown in Figure 4. The east wall of a meltwater channel occupied by Battle Creek can be seen just beyond the main belt of trees. View is to the east across the preglacial Battle Creek Valley. ISPG photo 4173-5.



Figure 4. Surface of closely spaced sandstone blocks about 2 to 5 m long and 1 to 2 m wide along the terminus of the ridge in Figure 2. Note the surface pits and rounded edges of blocks. View is to the east across the valley. ISPG photo 4173-2.



Figure 5. Vertical faces of blocks that form the outermost part of "The Rock Pile." Note the boulder resting on the upper surface of a block. View is west towards the valley wall. Scale is in feet. ISPG photo 4173-6.



Figure 6. Surface of the platform of sandstone blocks that form part of "The Rock Pile" along the terminus of a ridge crest. The rectangular and square blocks resulted from the intersection of sets of vertical joints trending north-south and east-west. ISPG photo 4173-1.

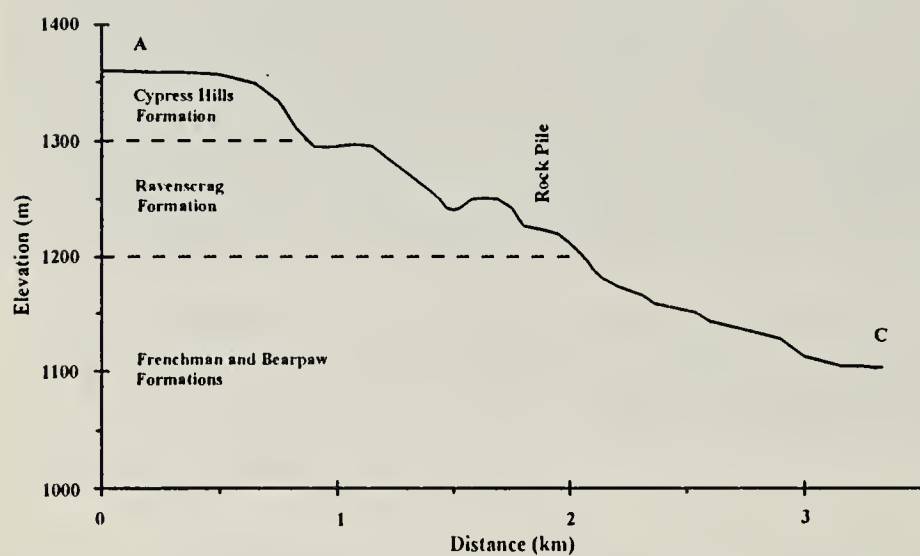
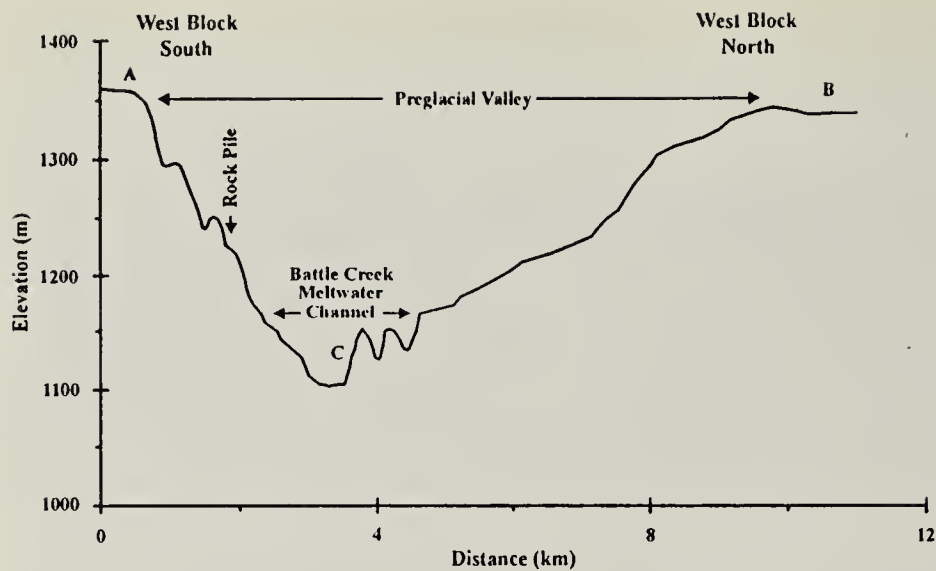


Figure 7. Topographic profile ACB taken north-south across preglacial Battle Creek Valley near Fort Walsh (upper figure) and geologic cross section AC of the south side of the Valley (lower figure).



Figure 8. Bowl-shaped weathering pit about 30 cm in diameter and 10 cm deep on the surface of a sandstone block (see figure 4). Scale is in feet. ISPG photo 4173.

NOTES AND LETTERS

COMMENTS ON ESKIMO CURLEW SIGHTINGS

BERNIE GOLLOP, 2202 York Ave.,
Saskatoon, SK. S7J 1J1

Your editor persuaded (actually, harassed) me to comment on two recent reports of Eskimo Curlews in *Blue Jay*. Hence this micro-manual on dealing with such observations.

Several field marks contribute to the validity of a sighting of Eskimo Curlew, Canada's rarest native breeding bird which, when seen alone, is difficult to differentiate from a Whimbrel in the prairie provinces. The differences are (1) *size* (Black-bellied Plover length, larger than Golden Plover or Killdeer and smaller than Willet; the Whimbrel is avocet- or Marbled Godwit size, a difference more regularly noticeable in spring than fall), (2) *stripe on top of head* (indistinct vs distinct),¹ (3) *underwing linings* (cinnamon, rather than grayish-brown), (4) *underside of primaries* (unbarred, as opposed to barred), and (5) *plumage* (browner, not grayer, particularly in spring).

Leg colour and eye stripe contrast may not be sufficiently different between the two and, while the ratio of bill length to head length is usually smaller in the Eskimo, this is a difficult determination and is less reliable in fall when the bills of young Whimbrels have not yet reached full length. In terms of bulk, as indicated by weight, at one extreme, small Eskimos are about half that of large Whimbrels; at the other extreme, while there is no overlap, the difference is less than 10%.

Any of the four most common field guides are good for size (but only

Peterson's gives minimum and maximum lengths) and under-primary barring (although in his eastern guide, Peterson states this can be determined only with a bird in the hand!). Peterson's western guide (p. 153 more than p. 131) and Robbins' may be best for the reddish underwing lining. Scott's National Geographic pictures immature fall Whimbrels as closer in colour to Eskimos than adults are.

Vocalizations are difficult to describe and different people hear and report the same sound differently. The Eskimo apparently repeats a note 2-3 times vs 6-7 for the Whimbrel. The calls of both species are given in each of the guides.

Every tool available should be used to document an Eskimo Curlew (or any other rare bird) sighting. The minimum should be a *detailed* written description of every part of the bird, particularly the head and bill. Note the different bill shapes in the two photos. A detailed sketch, labeling colours, is also recommended — no matter how poor an artist you are. Begin without reference to a field guide but, when you think you are finished, check one (or a copy of this article) to see if a key mark has been missed.

Describe and sketch any sounds — short vs long notes, different intervals between them, higher vs lower, turning up or down, louder or quieter. Were some sounds the quality of any other bird you are familiar with?

If you have a still camera, finish off the roll and use a second one. If I had a video camera with me, I would finish the tape, hopefully permitting an hour's filming. The advantage of a



Eskimo Curlews, Galveston Island, TX.

Don Bleitz

video camera is that it also records sound. (Might be worth carrying during the 8-day period these curlews have been reported.) I would then wait for the bird to fly or I would flush it at least once to determine (or confirm) and photograph the underwings and document its calls. (A spring migrant is not likely to remain put for hours until other birders arrive to view it. Fully document it now!)

Eskimo Curlews migrate through the prairie provinces (away from Hudson Bay) only in spring and often are found in summer fallow fields. Dated reports have been: *14 May* 1982 near Monica Slough, 5 km east-southeast of Regina; *15 May* 1996 near Killarney, MB, 360 km east-southeast of Regina; *20 May* 1996 near Kipling Marsh, 140 km east-southeast of Regina; *21 May* 1980 at St. Ambroise, MB, 475 km east of Regina. Several of these birds were probably shot near Moose Jaw, 70 km west of Regina, in early May 1891. John Richardson referred to specimens taken in spring 1827 at Carlton and Cumberland House, SK. On *19 May* 1890 a museum specimen was collected near Calgary and another in spring 1826 near Jasper, AB. Beginning in July, the major southward migration of this western-arctic-nesting species is east across the Northwest Territories, over the Labrador coast, the northeastern United States and the ocean to South America. A minor route passes through Churchill and continues southeast.

John Pollock's "possible sighting" of a single bird on *20 May* 1996 at Kipling Marsh, as reported in the June 1996 *Blue Jay*, is tantalizing — as he recognized. The observation was made long enough before sunset (1.5-2.5 hours) that the sun would not contribute to the "reddish

brown" wing lining, and he noted that there was no distinct midcrown stripe. However, these definitive field marks have to be balanced against "large shorebird" and "grayish-brown" plumage (neither is particularly negative) and the seemingly large bill. I think there is a better than 50% chance that the bird was an Eskimo Curlew — like 7 on a scale of 1 to 10.

Gwen and Lloyd Powell's "possible sighting" of three birds on *15 May* 1996 south of Killarney, MB, as reported by Bob Waldon in the September 1996 *Blue Jay*, emphasizes measurements, based on a Killdeer beside them. They give the curlews' lengths as 11-14"; the eastern Peterson guide they had with them gives 9-11" for Killdeer. Measurements in the National Geographic and both Peterson guides are of museum skins — specimens stuffed and laid out in a straight line. Only in Robbins' guide is length based on "thousands of live birds hand-held in natural positions." For Eskimo Curlew, Robbins gives 11", which is probably an educated guess because he would have had only a few century-old skins to work with. Peterson gives 12-14" and, for Whimbrel, 15-19".

The important point is that the "dainty" birds were just a little larger than a Killdeer, much too small for a spring Whimbrel. Other medium-sized shorebirds with noticeably down-curved bills are smaller than Killdeer. As for the chances of the birds being Eskimo Curlews, I would restrict my rating to a 9 because of the somewhat ambiguous reference to "light stripes and brown stripes on the head." (It should be noted that even my or any number of 10s would not be accepted as a confirmed record in many jurisdictions without adequate photos or sound recordings

— a stipulation that may warrant review.)

I gave an early draft of this article to, in alphabetical order, Stan Shadick, Al Smith, Guy Wapple and Michael Williams for comment. Their ratings, from low to high, were 5, 5, 6 and 7 for the Saskatchewan observation and 8, 8, 9, 9 for the Manitoba one.

Strictly speaking, the above ratings infer the chances of the birds' not being a Whimbrel. They do not consider the possibility of the Eskimos' being Asia's Little Curlew (with only two fall California sightings confirmed for North America). Among the big four field guides, only the western Peterson illustrates this species. The Little has the Whimbrel's underwing colouring and contrasting crown stripe. At rest, the Little Curlew's wing tips are about even with the tip of the tail (may be same for Whimbrel); they extend beyond it in the Eskimo (illustrated by photos in Nature Saskatchewan's monograph on the species¹). When very close, it may be possible to decipher the scales on the back of the leg: small

and hexagonal for Little, long (transverse) and narrow for Eskimo and Whimbrel. The Kipling bird was probably not a Little Curlew because of wing lining and crown descriptions. The Killarney birds could have been.

Turning to reference books, *The Audubon Society Master Guide to Birding* (1983, Vol. 1) has a coloured photo of an Eskimo Curlew and a painting which is erroneous in that the underwing linings are not "cinnamon" as described in the text. Houghton Mifflin's *Shorebirds* — an identification guide to the waders of the world by Hayman, Marchant and Prater (1986) is well worth studying. It has twice as much text devoted to description as the four field guides combined and 30 images of the three curlews, including one that shows how short a fall Whimbrel's bill can be — equal in length to the longest Eskimo's. Fall "Eskimo Curlews" on the southern prairies probably are not.

1. GOLLOP, J.B., T.W. BARRY and E.H. IVERSEN. 1986. Eskimo Curlew — a vanishing species? Saskatchewan Natural History Society, Regina. 159 pp.

CALLING ALL BIRDERS

One way to enhance your birding fun is by taking part in a scientific project — simply by looking more closely at all individuals you see of the following five species. Some of each are wearing coloured legbands or have had coloured plastic tags attached to a wing to determine their movements. Finding one would be a major achievement — in the same category as finding a very rare bird or the needle in a haystack. Reporting one will be a significant contribution to the project.

You can report observations directly to the project leader or to Bernie Gollop for forwarding at 2202 York Ave., Saskatoon SK S7J 1J1; phone (306) 343-1027; fax (306) 242-4756, or e-mail to Marshall.Gilliland@USASK.ca. For legbands this means which colour is on top (if more than one) and which leg(s) they are on; for wing tags, which wing.

American Bitterns with coloured wing tags are from the Agassiz National Wildlife Refuge in Minnesota. Phone (218) 449-4115.

More than 3000 White-faced Ibis have been colour-banded with two legbands in the Great Basin, Nevada. Eric Kelchin, USF&W, Stillwater National Wildlife Refuge, Fallon, Nevada 89406-1236; or phone (702) 423-5128.

Willetts have been banded in Oregon with coloured legbands and wing flags. David Mehlman, NBS-FRESC, 3200 SW Jefferson Way, Corvallis, Oregon 97331, or call (541) 750-7495, or fax (541) 758-7761, or e-mail to mehlman@fsl.orst.edu.

Semipalmated Sandpipers were colour-banded in Delaware Bay, Delaware, with a combination of bands and flags. David Mizrahi, Department of Biological Sciences, Box 341903, Clemson University, Clemson, South Carolina 29634-1903, or call (864) 656-3585, or fax (864) 656-0435 or e-mail at dmizrah@hubcap.clemson.edu.

Ring-billed Gulls were colour legbanded in western New York. John M. Peterson, High Peaks Audubon Society, RR 1, Box 230, Elizabethtown NY 12932-9721 or call (518) 873-2052.

- From *Bird Watcher's Digest*, Jan/Feb 1997.



Grizzly Bear

Wayne Lynch

MEMBERSHIP APPLICATION FORM

☐ New Member ☐ Renewal

Name (please print)

Address

City Prov. Postal Code

Phone FAX E-Mail

☐ Change of Address: Please write in new address above

☐ Gift Membership:

Name (please print)

Address

City Prov. Postal Code

Phone FAX E-Mail

Category	One Year	Three Year	Five Year
Individual	<input type="checkbox"/> \$25	<input type="checkbox"/> \$65	<input type="checkbox"/> \$95
Family	<input type="checkbox"/> \$30	<input type="checkbox"/> \$75	<input type="checkbox"/> \$115
Youth (<18 years)	<input type="checkbox"/> \$20	<input type="checkbox"/> \$50	<input type="checkbox"/> \$75
Senior (>64 years)	<input type="checkbox"/> \$20	<input type="checkbox"/> \$50	<input type="checkbox"/> \$75
Foreign	<input type="checkbox"/> \$30	<input type="checkbox"/> \$75	<input type="checkbox"/> \$115
Sustaining	<input type="checkbox"/> \$50		
Patron	<input type="checkbox"/> \$100		
Life	<input type="checkbox"/> \$600		

I wish to make a tax creditable donation to Nature Saskatchewan:

<input type="checkbox"/> Education Fund	\$ _____	<input type="checkbox"/> Royal Sask. Museum Exhibit Fund....	\$ _____
<input type="checkbox"/> Habitat Conservation Fund	\$ _____	<input type="checkbox"/> Last Mountain Bird Observatory	\$ _____
<input type="checkbox"/> Grasslands Trust Fund	\$ _____	<input type="checkbox"/> Non-specified	\$ _____
<input type="checkbox"/> Endangered Species Fund	\$ _____		

SPECIAL OFFER to join our national affiliate, the Canadian Nature Federation.

With every CNF membership purchased through Nature Saskatchewan, CNF will donate \$4 to the Grasslands Trust Fund. Membership benefits include quarterly issues of the award-winning nature magazine *Nature Canada* and the conservation newsletter *Nature Alert*.

☐ Individual \$33 ☐ Family \$40 ☐ Send information on CNF

Fee Total

Nature Saskatchewan Membership \$ _____

Nature Saskatchewan Donation \$ _____

Canadian Nature Federation Dues \$ _____

Total \$ _____

I would like to pay by: ☐ Cheque ☐ Visa ☐ Mastercard

Cardholder's Name: _____

Credit card number _/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_

Expiry date _/_/ _/_/ Signature _____

Make cheques and money orders payable to NATURE SASKATCHEWAN.

Mail to: Nature Saskatchewan
206-1860 Lorne Street
Regina, Saskatchewan S4P 2L7

Do you know of any person interested in natural history and conservation who does not receive the *Blue Jay*? Please send their name and address and we will send a sample *Blue Jay* and an invitation to join our Society.

Renew by Phone!

Call toll-free: 1-800-667-4668 (Saskatchewan only) or (306) 780-9273

FAX (306) 780-9263

to renew by Visa or Mastercard

THIS ORGANIZATION RECEIVES FUNDING FROM:





**NATURE SASKATCHEWAN
and BLUE JAY BOOKSHOP**

206-1860 Lorne Street, REGINA, SASKATCHEWAN
S4P 2L7

(306) 780-9273 — in Regina

1-800-667-HOOT (4668) — elsewhere in
Saskatchewan

FAX (306) 780-9263

E-mail: nature.sask@unibase.unibase.com

BOARD OF DIRECTORS

Honorary President.....C. Stuart Houston.....Saskatoon

OFFICERS

1st President.....Paul James..... Regina

President.....Bob Berthiaume..... Regina

1st Vice-President.....Melanie Elliott.....Saskatoon

Education Committee

2nd Vice-President.....Kathleen Donauer..... Regina

Fund Development

Member Initiatives

Treasurer.....Dale Hjertaas..... Regina

Finance Committee

Recording Secretary.....Lance Irvine..... Yorkton

EXECUTIVE OFFICE

Executive Director.....Curt Schroeder..... Regina

Administrative Assistant.....Shari Martinook..... Regina

REPRESENTATIVES AT LARGE

Melanie Elliott.....Blue Jay Bookshop..... Regina

Milton Greenwood.....Species & Spaces..... Prince Albert

Dale Hjertaas.....Membership..... Regina

Keith Nelson.....Conservation.....Saskatoon

David Saul.....Species & Spaces..... Semans

John.....Blue Jay Editor.....Saskatoon

POINTED DIRECTORS

John Gilliland.....Special Publications.....Saskatoon

RESIDENTS OF LOCAL SOCIETIES

St. Qu'Appelle Natural History Society..... Phyllis Bordass

Wan Head Natural History Society.....David Gehl

Fort Natural History Society.....Kate Johnson

St. Louis Moose Jaw.....Al Gurnsey

St. Louis Prince Albert.....Carman Dodge

Regina Natural History Society.....Curt Schroeder

Saskatoon Nature Society Inc.....Jim Hay

Southwest Naturalists.....Susan McAdam

Weyburn Nature Society Inc.....Ray Belanger

Yorkton Natural History Society.....Warren Hjertaas

University of Alberta
Bibliographic Services - Serials
Edmonton, Alberta

C UNIALB

T6G 2J8
CAN

Expiry Date
Dec 31 1997



Public Sales Agreement No. 0431095.
Postage paid at Regina.
Please return unclaimed copies.
Return postage guaranteed.

206-1860 Lorne Street,
Regina, Saskatchewan.
S4P 2L7



Acid Free/Recycled Paper

University of Alberta Library



0 1620 1210 5928